Competing in the Age of AI

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Dorothy and Michael Hintze Fellow
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The Age of AI

Digitization Is Transforming Our Economy…

Phase	Mainframes/ Corporate Networks	PC and Web	Cloud and Mobile	Networks and AI
	Pre 1995	*1995 – 2005*	*2005 – 2015*	*2015 – ???*
Technology	▪ Corporate Networks ▪ Tools, applications ▪ Mainframes/minis ▪ Email, early EDI	▪ Networks explode ▪ PCs, browsers ▪ Static content	▪ Mobile explodes ▪ Cloud emerges ▪ AI returns	▪ Cloud dominates ▪ IOT, AR emerge ▪ "AI first"
Economic Architecture	**Products, Industries** ▪ IT ecosystem begins ▪ Software licensing ▪ Direct monetization of customer	**Early Software Ecosystems** ▪ IT ecosystem scales ▪ Localized networks within industries	**Ecosystems network across Industries** ▪ Digital APIs begin to connect industries ▪ Value capture starts to tip	**"Hub Economy"** ▪ All industries connected into a giant ecosystem ▪ AI driving transformation ▪ Collisions between digital and traditional firms
Iconic Firms	IBM, digital	Microsoft, Yahoo!, ebay	Google, facebook	Alphabet, Alibaba.com, ethereum, amazon

AI Hype

The Weaponization Of Artificial Intelligence

Invest in AI-based technology or lose the race, Israel's chief scientist warns

Why your AI might be racist

A.I. Expert Says Automation Could Replace 40% of Jobs in 15 Years

China's Baidu Credits Artificial Intelligence for Robust Ad Sales

Firm Led by Google Veterans Uses A.I. to 'Nudge' Workers Toward Happiness

The Future of Artificial Intelligence In The Workplace

Miners Say They Dig Artificial Intelligence but the Gold Rush Hasn't Come

A 19-year-old developed the code for the AI portrait that sold for $432,000 at Christie's

America is split over advancing artificial intelligence

Awaiting the AI-Enabled Revolution, Experts Put in a Good Word for Humans

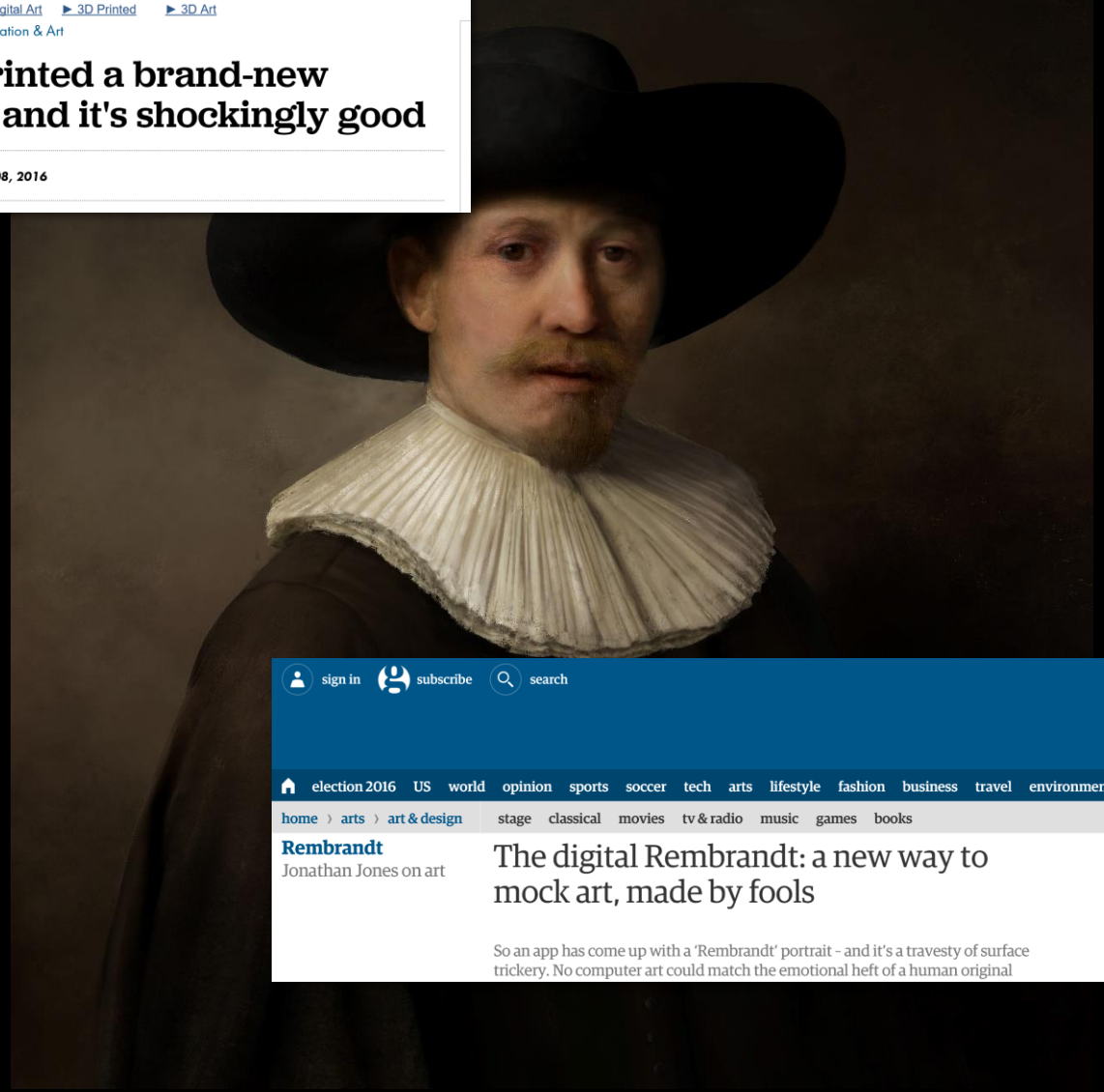
As AI evolves, so must VC investment teams

Curbs on A.I. Exports? Silicon Valley Fears Losing Its Edge

Nasdaq CIO Puts AI to Work

China's application of AI should be a Sputnik moment for the U.S. But will it be?

Why Canada Believes It Can Lead Global AI Innovation



DigitalArts
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AI just 3D printed a brand-new Rembrandt, and it's shockingly good

By Katherine Noyes | on April 08, 2016

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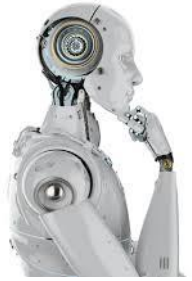
Rembrandt
Jonathan Jones on art

The digital Rembrandt: a new way to mock art, made by fools

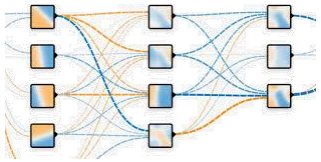
So an app has come up with a 'Rembrandt' portrait – and it's a travesty of surface trickery. No computer art could match the emotional heft of a human original

Definitions of AI



"Machines that can think and act in a way that matches or surpasses human intelligence" ("Strong AI")

Any activity computers are able to perform that humans once performed" ("Weak AI")

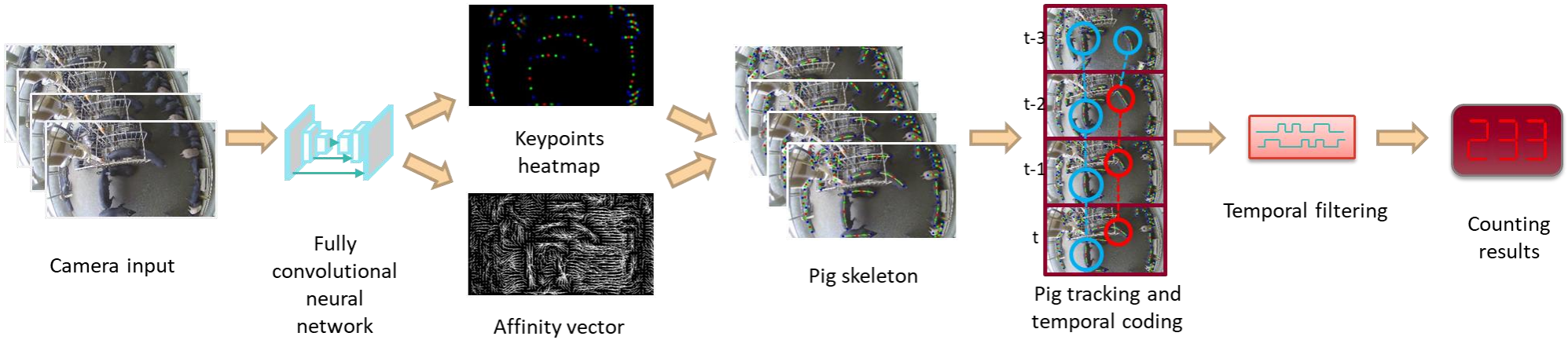


Nils J. Nilsson, 2010; Stanford AI 100 report, 2016.

Example: Pig Counting

Difficulties in manual pig counting:

- ❑ Pigs have similar appearance and move around quickly
- ❑ Large overlapping areas between pigs due to high breeding density
- ❑ Potential disease infection from frequent interaction between pigs and humans



京东数科

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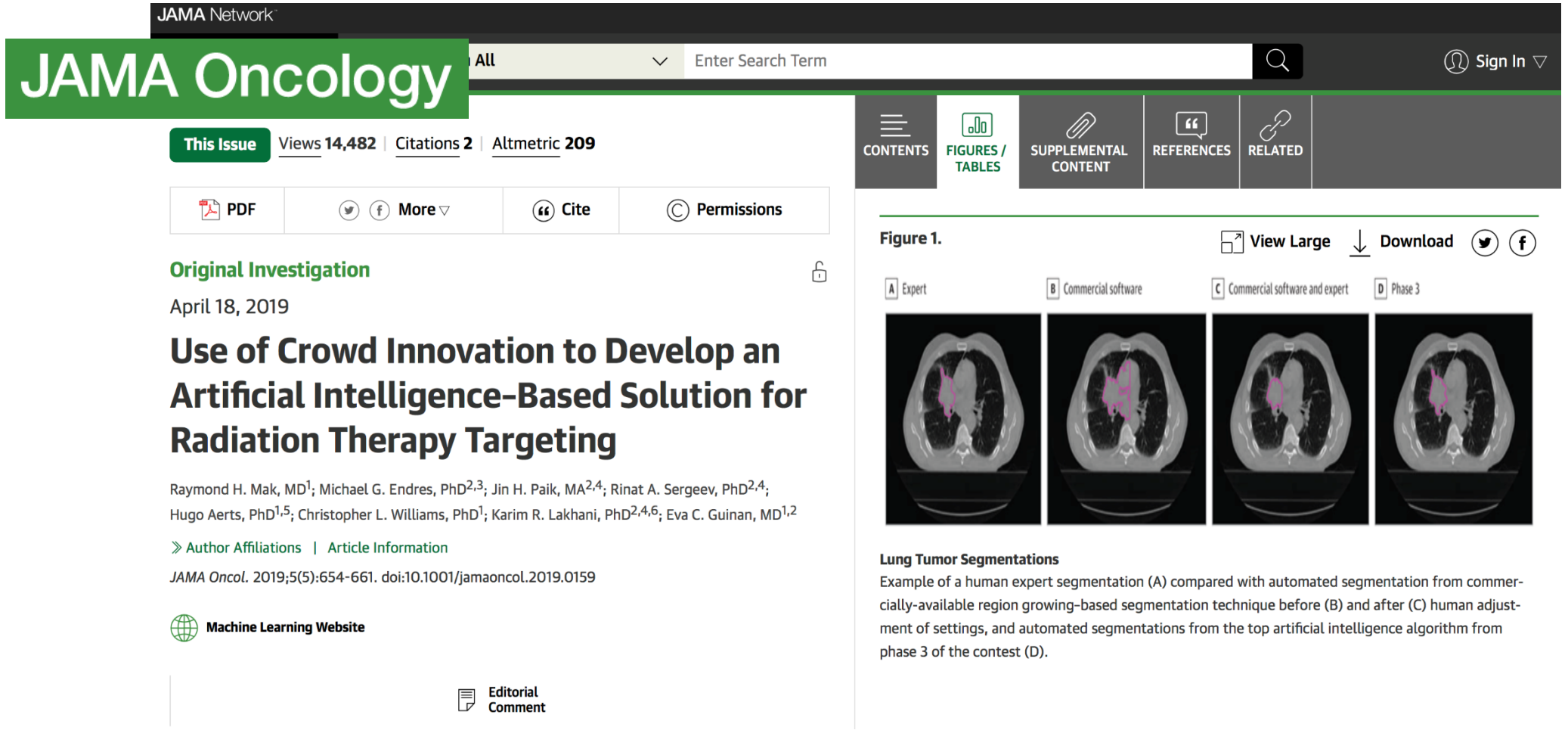
Example: Radiation therapy targeting



JAMA Network

JAMA Oncology

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Original Investigation

April 18, 2019

Use of Crowd Innovation to Develop an Artificial Intelligence–Based Solution for Radiation Therapy Targeting

Raymond H. Mak, MD[1]; Michael G. Endres, PhD[2,3]; Jin H. Paik, MA[2,4]; Rinat A. Sergeev, PhD[2,4]; Hugo Aerts, PhD[1,5]; Christopher L. Williams, PhD[1]; Karim R. Lakhani, PhD[2,4,6]; Eva C. Guinan, MD[1,2]

Author Affiliations | Article Information

JAMA Oncol. 2019;5(5):654-661. doi:10.1001/jamaoncol.2019.0159

Machine Learning Website

Editorial Comment

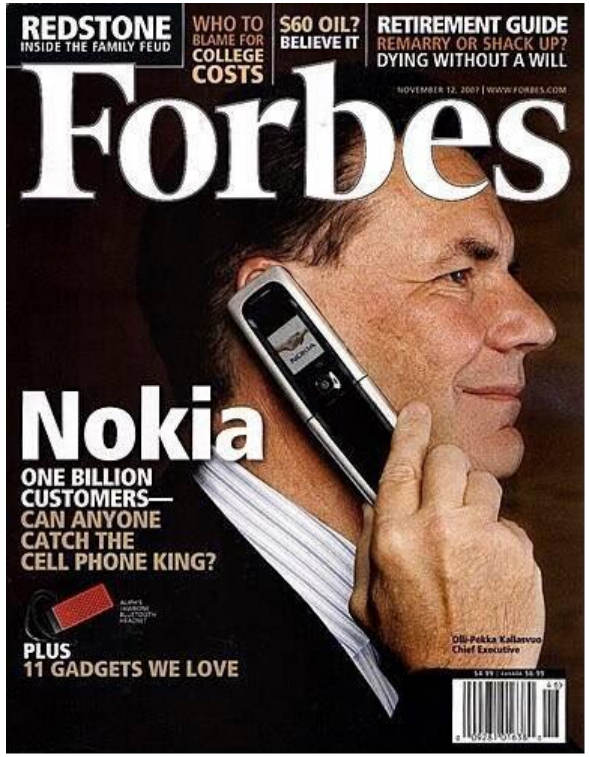
Figure 1. View Large | Download

A Expert | B Commercial software | C Commercial software and expert | D Phase 3

Lung Tumor Segmentations

Example of a human expert segmentation (A) compared with automated segmentation from commercially-available region growing–based segmentation technique before (B) and after (C) human adjustment of settings, and automated segmentations from the top artificial intelligence algorithm from phase 3 of the contest (D).

The wake up call…

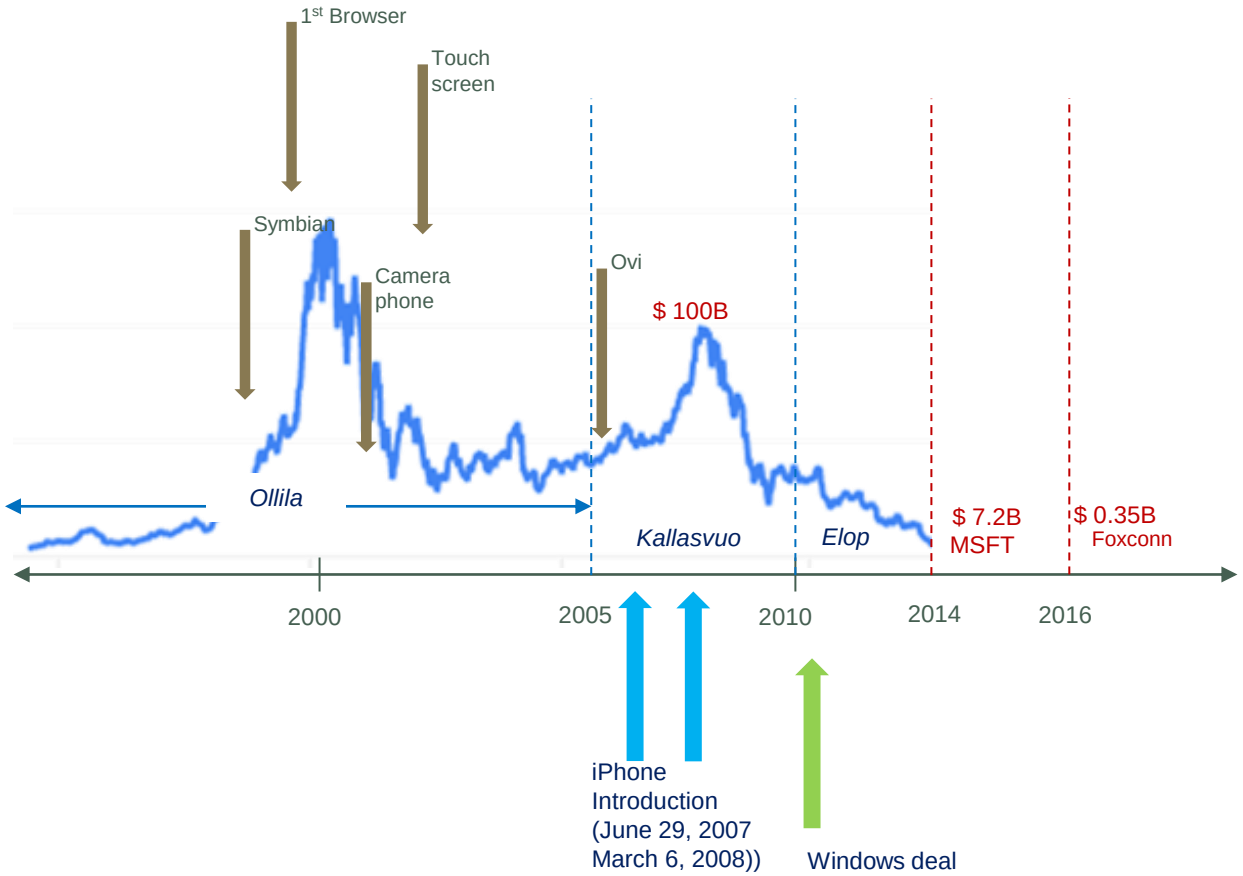


What killed Nokia?

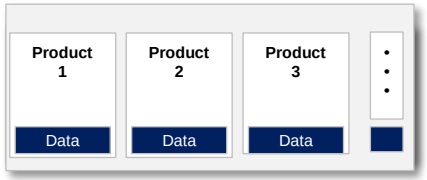
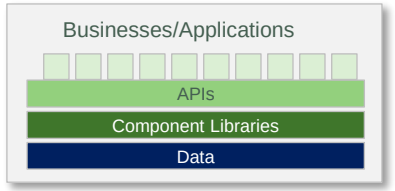
NOKIA

Key Nokia Firsts

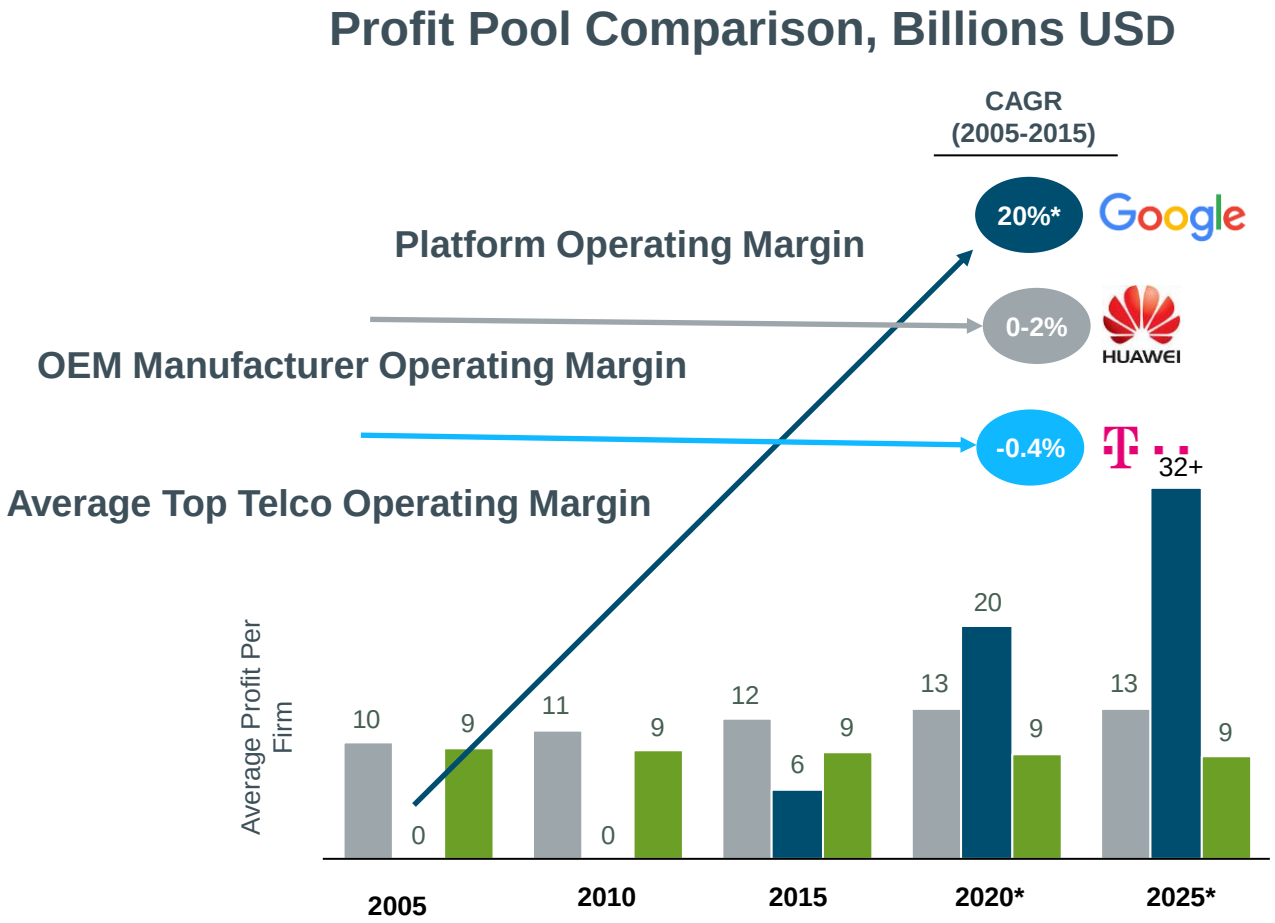
- 1999: first phone w/ web browser
- 2000: first smartphone that allows third-party apps
- 2002: second in offering camera phone
- 2003: first phone with touchscreen
- 2007: Ovi appstore, acquiring Navteq (digital map), Symbian market share: 67%



Nokia was killed by the collision between very different firms, with different operating architectures

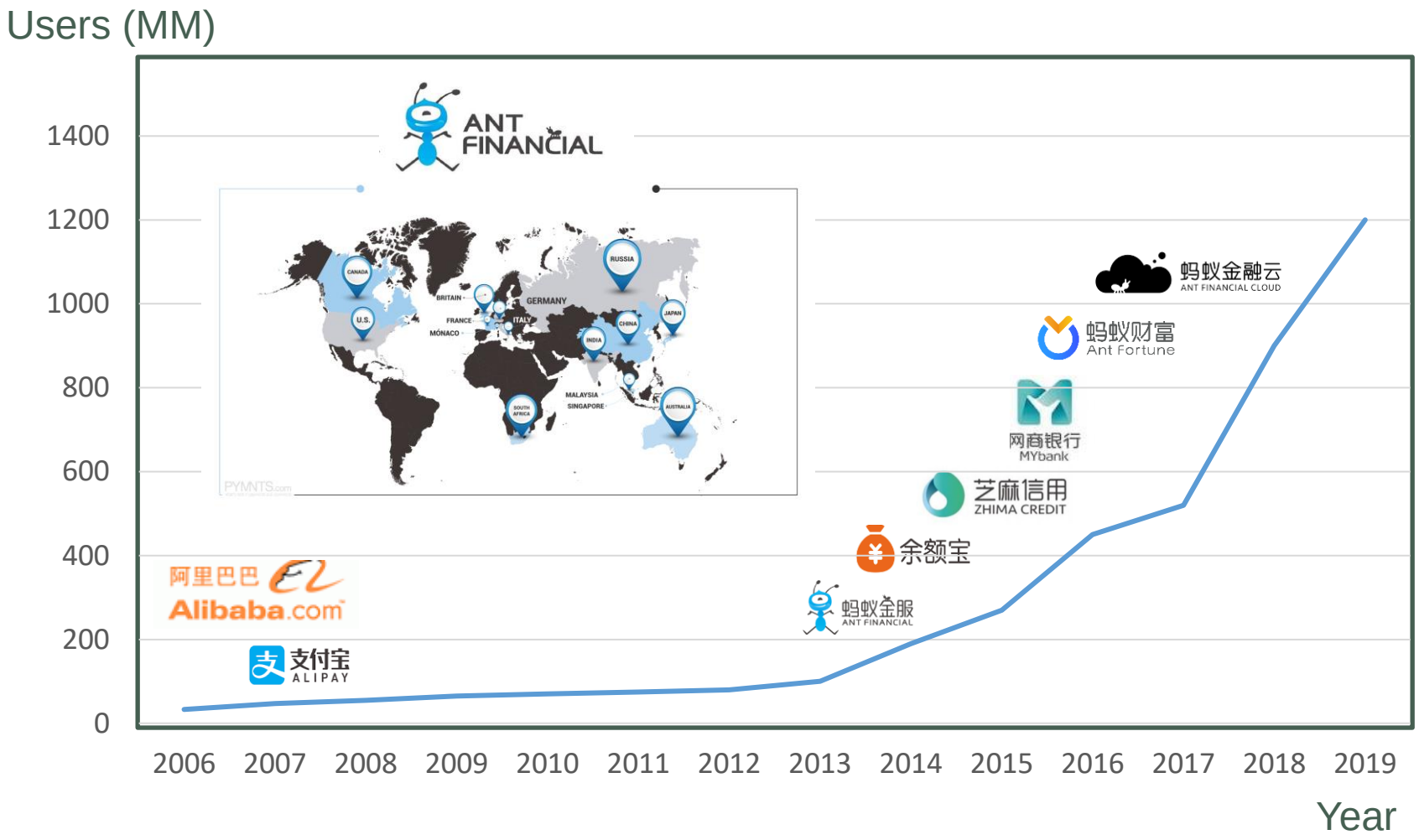
	NOKIA ***Product Operating Model***	Google ***Digital (Platform) Operating Model***
		
Organization	▪ Several products/product lines ▪ Focused and dedicated teams ▪ Heavyweight project management ▪ SW/HW optimized by product line ▪ Data/analytics embedded in product	▪ One platform ▪ many applications (internal or external) ▪ Functional structure, ad hoc teams ▪ Centralized, common data group ▪ Distributed development, universal APIs
Process	▪ Top down waterfall/stage gate ▪ Internal development ▪ Proprietary IP	▪ App development iterative, agile, sprints ▪ Core platform development top down ▪ Ecosystem focus
Technology	▪ “Platform” defined as common components across product units ▪ Every product customized ▪ “Clunky” APIs, tiny ecosystem	▪ Platform defined as unified operating architecture ▪ “One” HW product, open APIs ▪ Massive ecosystem enables key features, complexity, innovation, experimentation

What happened: industry transformation, concentration of the software layer, and value migration

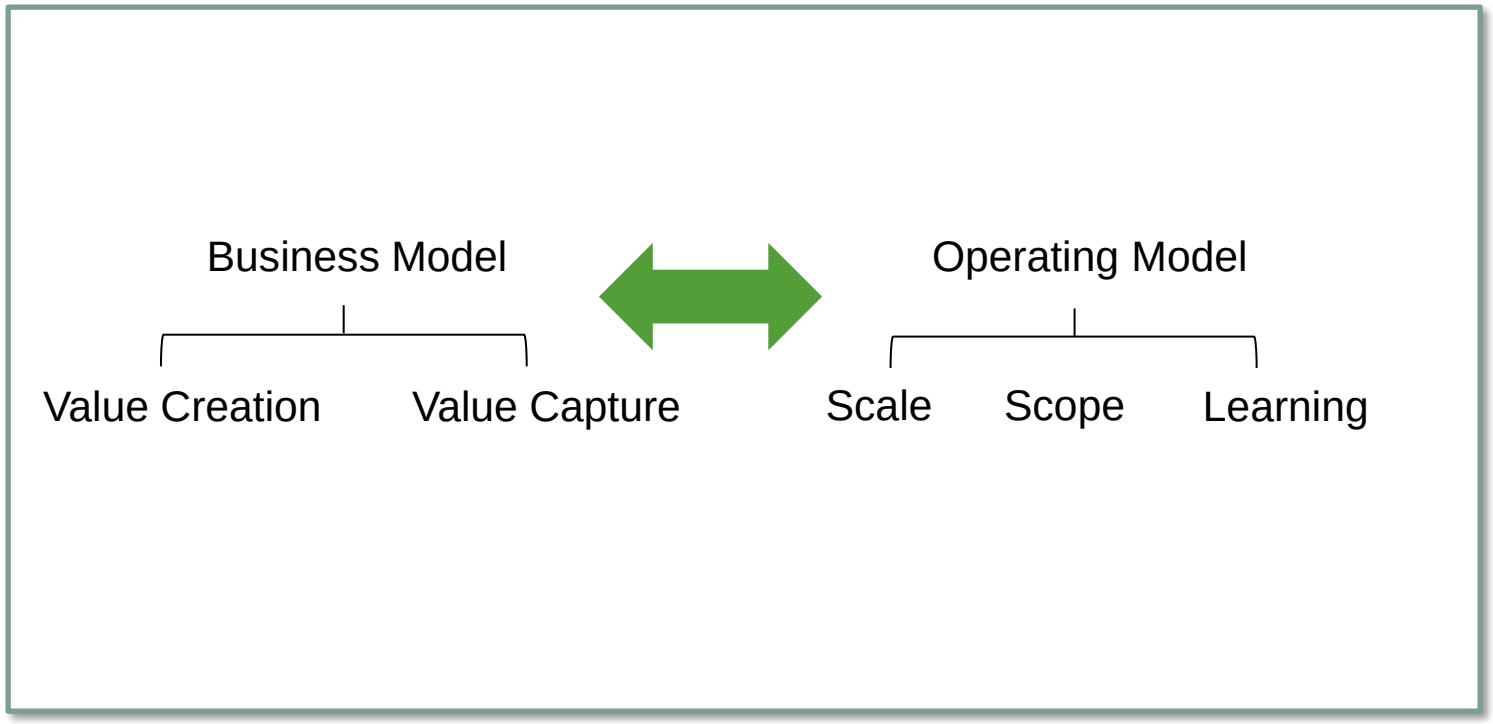


The Emergence of the Digital “AI First” Firm

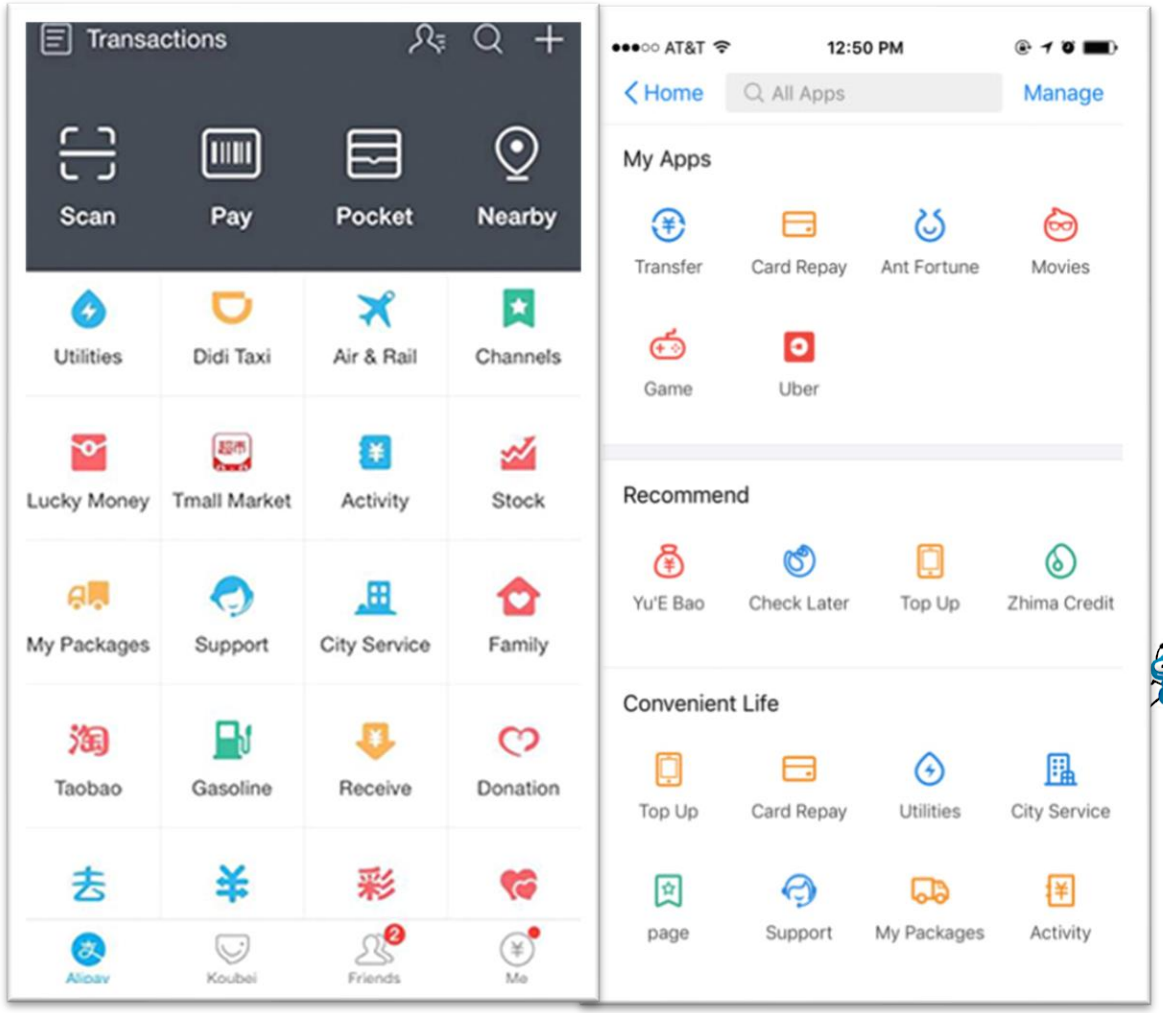
Data, AI and digital networks are changing the nature of firms: The Ant Financial Story



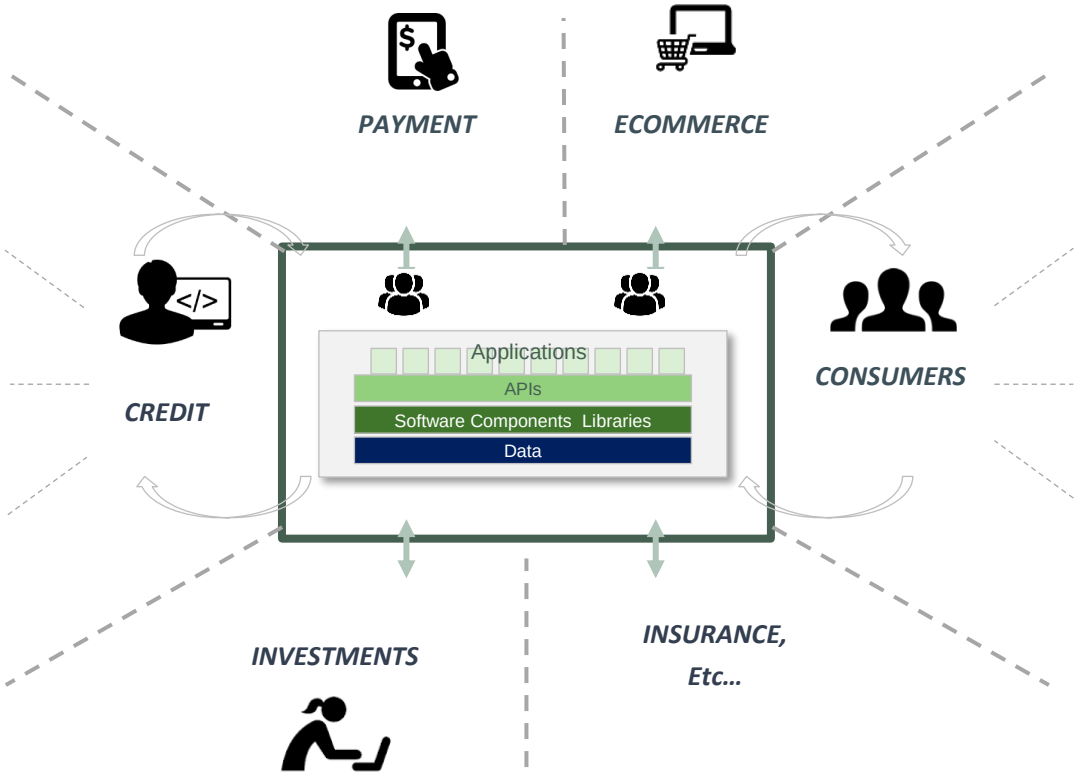
To understand companies like Ant Financial we need to reflect on how firms create, capture and deliver value



Ant Financial Aims to be a “Finlife” Provider



Firms like Ant use AI to drive digital scale, scope, and learning

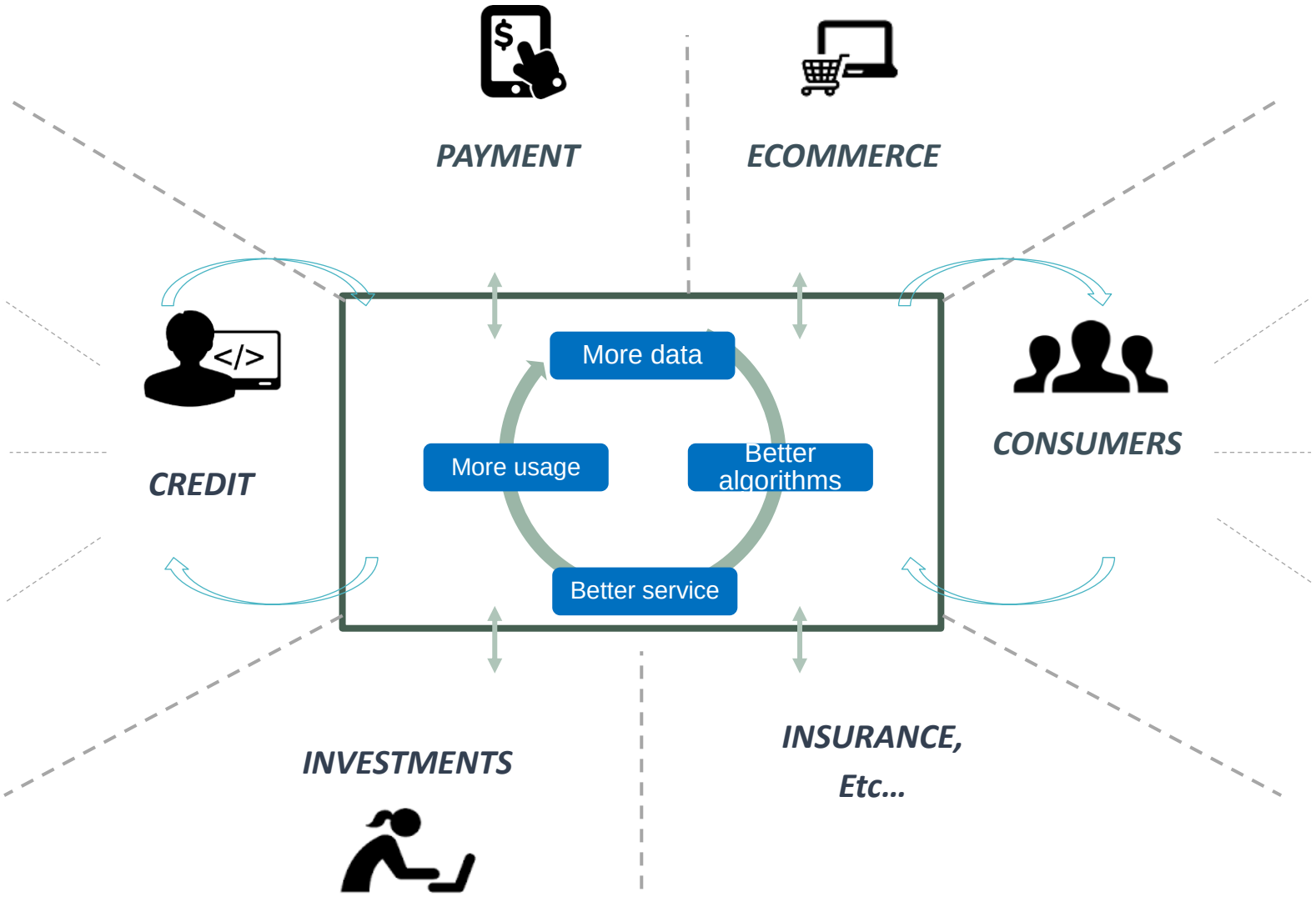


At Ant traditional human centered processes are digitized to connect with market opportunities at near zero marginal cost. Operational bottlenecks are digitized.

"AI is the new runtime that is going to shape all that we do"

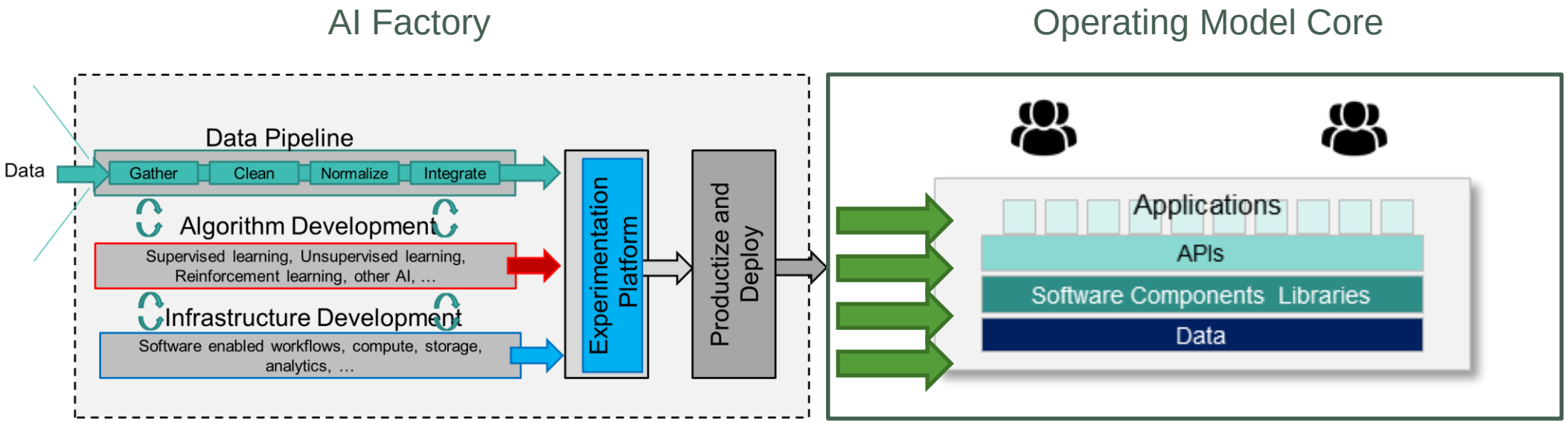
- Satya Nadella

Firms like Ant use AI to drive digital learning

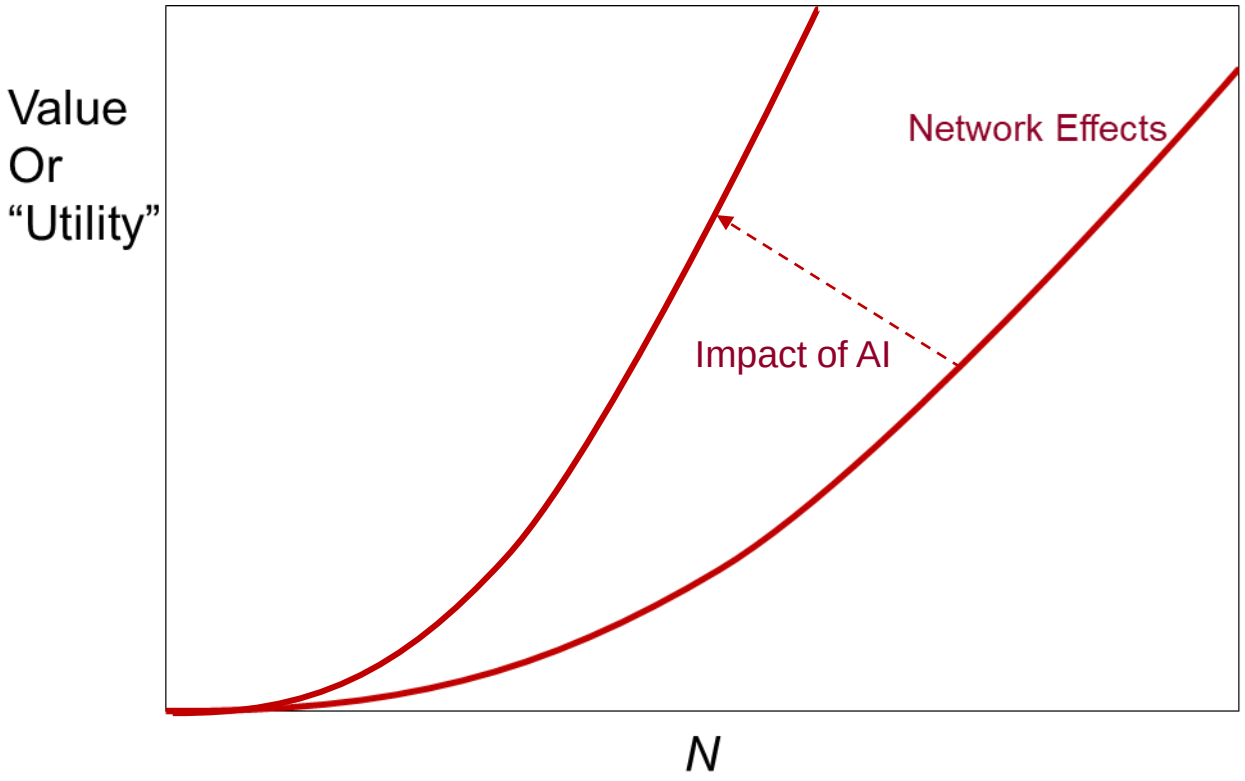


The data accumulated drives improvement, experimentation, innovation, and personalization.

The AI Factory feeds data and models systematically into the software enabled operating core of the firm

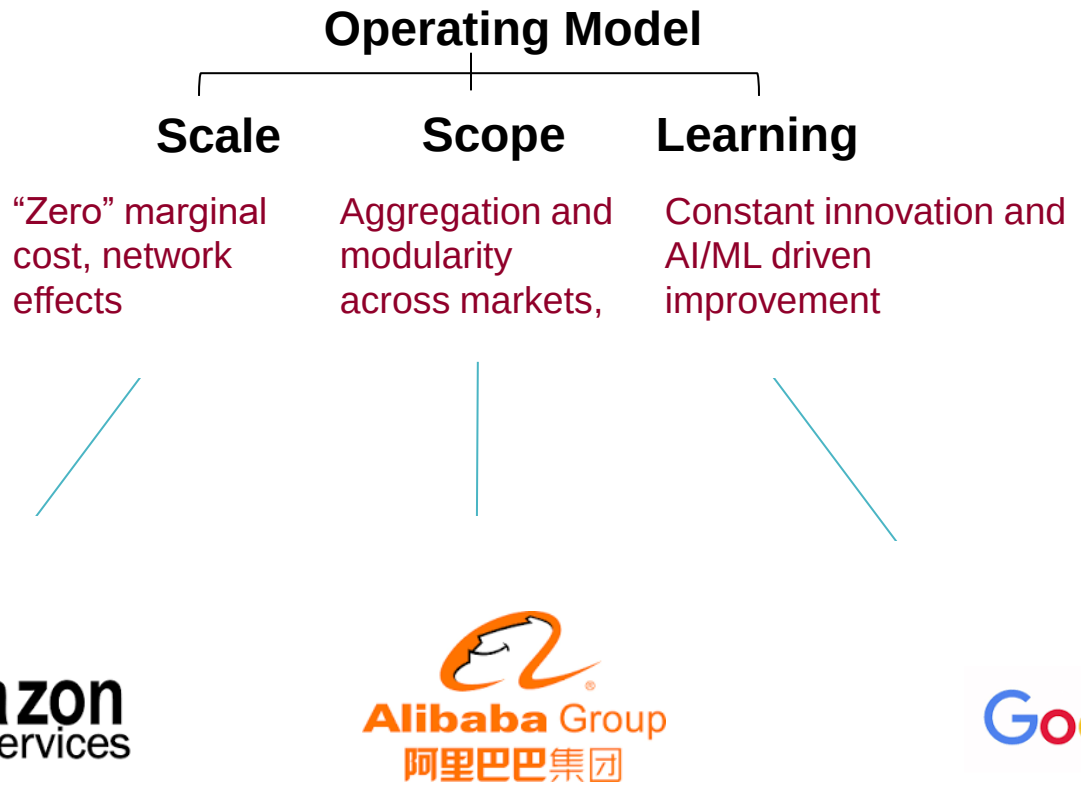


Digital Operating Models have Near Zero Marginal Costs and can Generate “Network” and “Learning” Effects

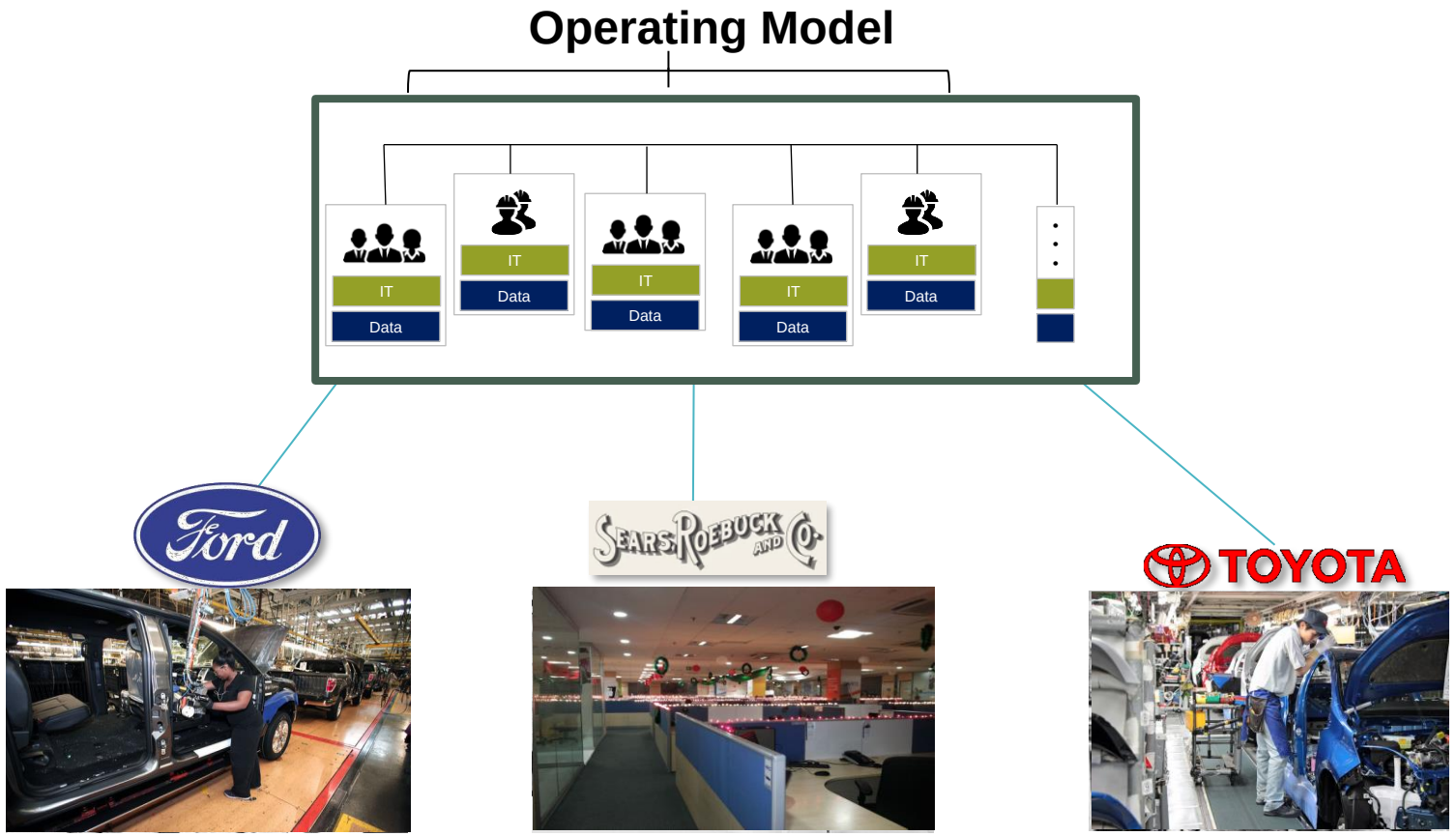


Digital Operating Models

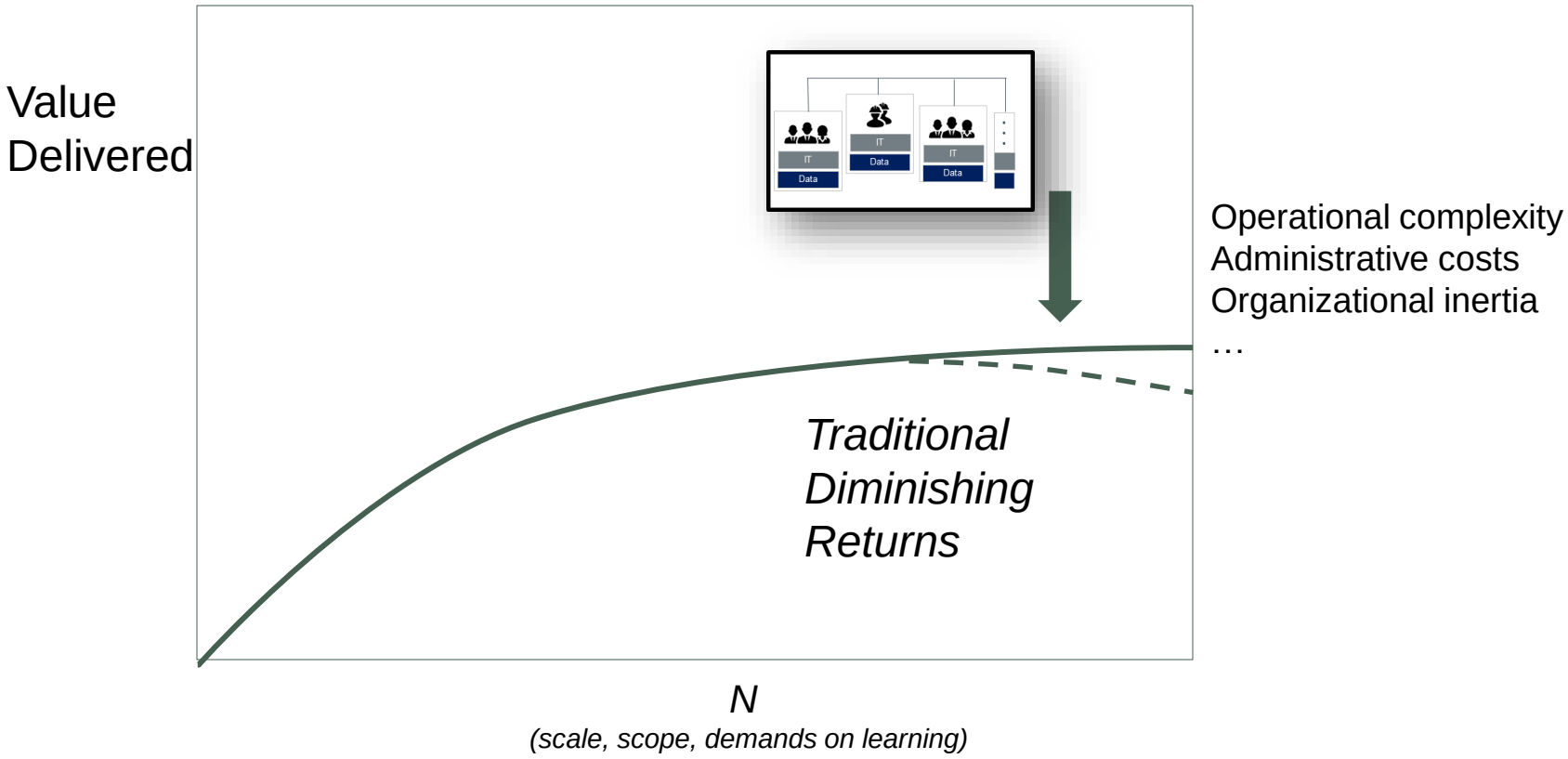
…move human labor off the critical path and remove traditional constraints to scale, scope and learning



Traditional Operating Performance Drivers

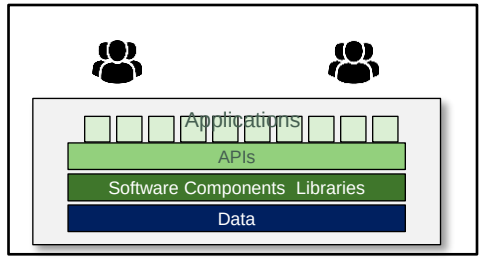


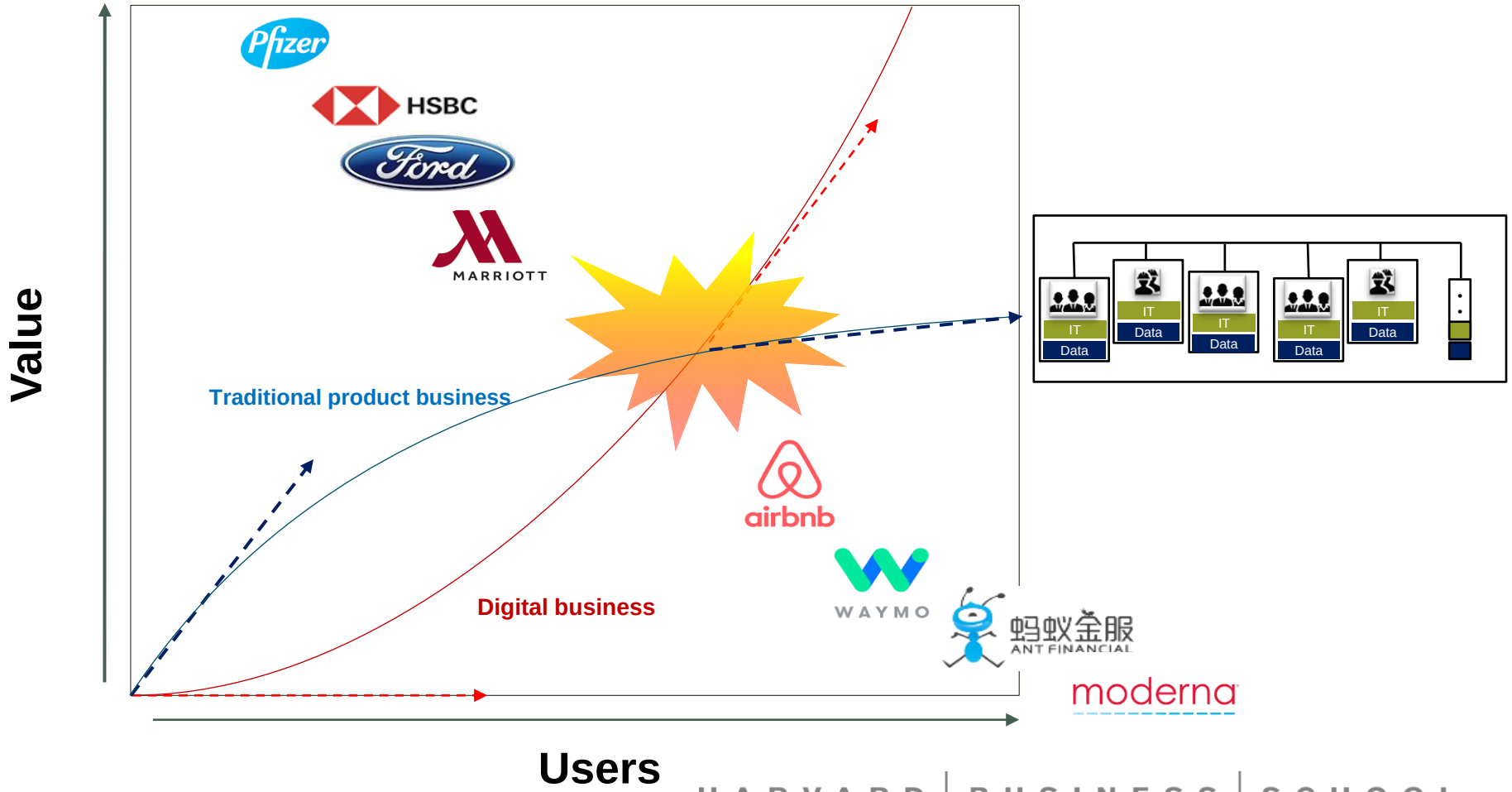
Traditional Operating Models Can Constrain the Value of the Firm



From Disruption to “Collision”…

What happens when a firm that has competed in a traditional market starts to compete with a firm based on a digital operating model?





Transforming into an AI-first Firm

Amazon’s architecture and operating model enables rapid innovation, experimentation and growth

Amazon’s operating model

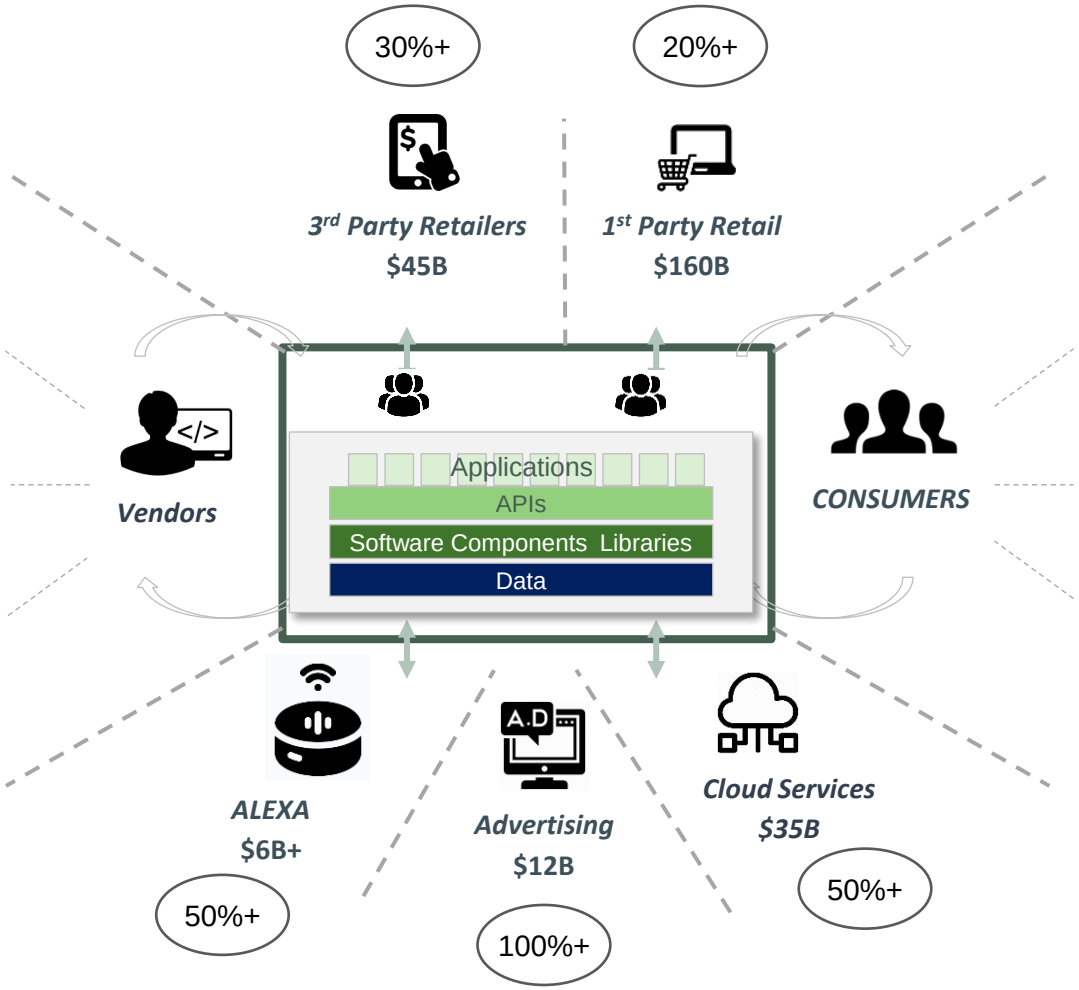
Modular services based platform
Enable reuse of code and data across functions, no-downtime deployments, continuous delivery

Self organizing agile teams
People closest to the customer needs accountable for rapidly innovating

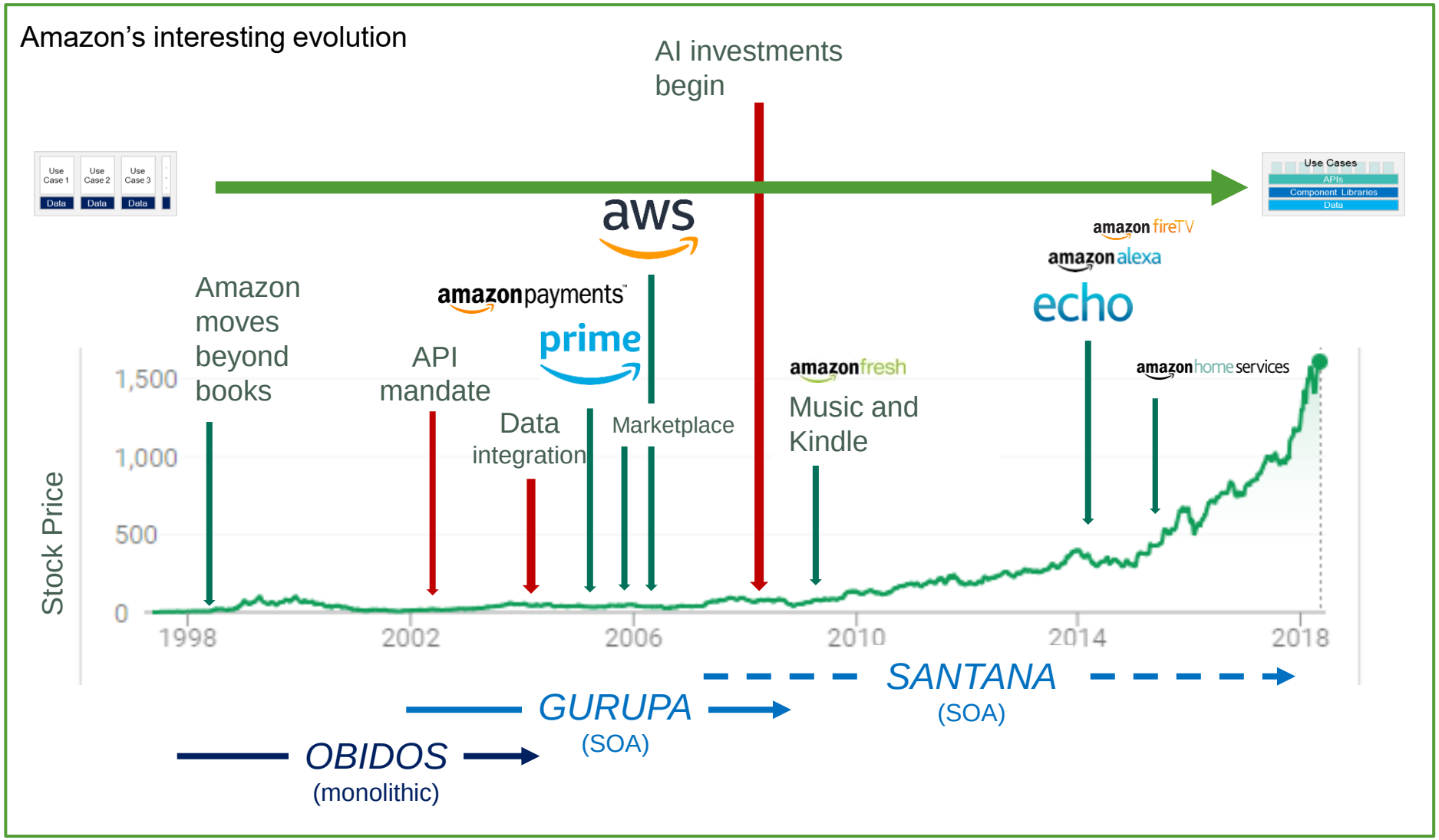
Modern KPIs for organization
Engagement, health, automation, …..

Low touch customer experience
Most service request solved automatically

Automated back office
Over 75% of back office is automated



Prior to 2002, Amazon was built like a traditional company



Bezos API Mandate

"All teams will henceforth expose their data and functionality through service interfaces.

Teams must communicate with each other through these interfaces.

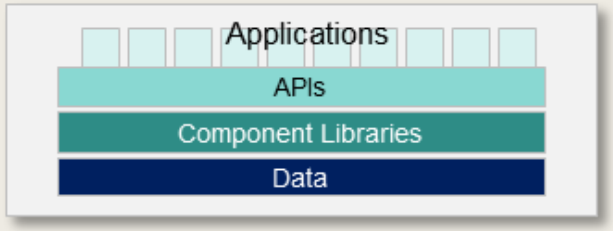
There will be no other form of inter-process communication allowed: no direct linking, no direct reads of another team's data store, no shared-memory model, no back-doors whatsoever. The only communication allowed is via service interface calls over the network.

It doesn't matter what technology they use.

All service interfaces, without exception, must be designed from the ground up to be externalizable. That is to say, the team must plan and design to be able to expose the interface to developers in the outside world. No exceptions.

Anyone who doesn't do this will be fired. Thank you; have a nice day!"

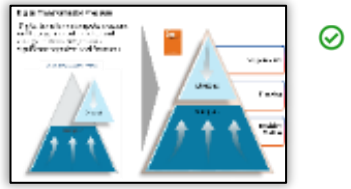
Jeff Bezos (2002)



Four transformation principles

ONE STRATEGY

- Directed
- Emergent



- Top down vision
- Aligned strategy, measurements and incentives

ONE ARCHITECTURE

- Top down vision
- Modular, API driven
- Unified approach

Architecture evolution

Monolithic *API based*

- Build it once: single, modular architecture
- Product management mindset

CAPABILITY DEVELOPMENT

- Dedicated, committed team
- Strong leadership
- Pilot structure and process, not just technology

Customer confusion | Unified experiences

- Senior management sponsorship
- Digital hires
- Capabilities and skills assessment

GOVERNANCE

- Integration with portfolio planning process
- Information strategy and risk
- Platform specific performance measurement

- Planning process
- Fabric for integration
- New KPIs & incentives

Comcast evolved from traditional cable provider to multi-service home platform

Smart Home Partnerships & Licensing

Partnered with existing smart home providers for Xfinity integration, plans to **white-label**

Advanced Advertising Services

Offers a **wide range of advertising services** through its **Advanced Advertising Group**

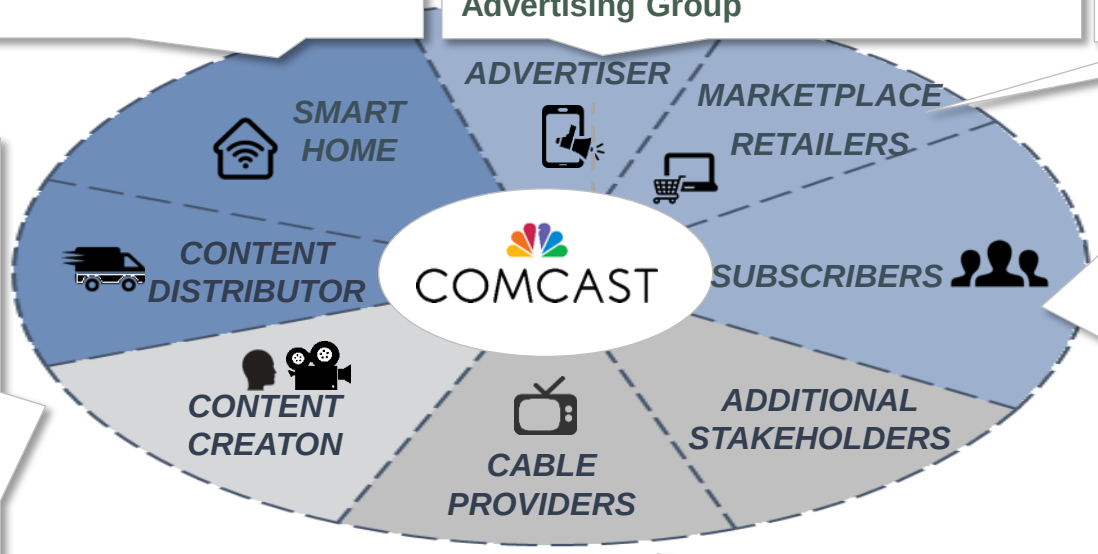
E-commerce Platform

Works with TheTake.ai to test **in-video shopping experience**

On-Demand Partnership

X1 Platform is **open to OTT Providers**

YouTube pandora NETFLIX iHeart RADIO



User Engagement

"[Comcast's recent streak of subscriber growth] in the face of increasing competition speaks volumes about ***Comcast's leadership position developed with the X1 platform"***

- CEO, Comcast

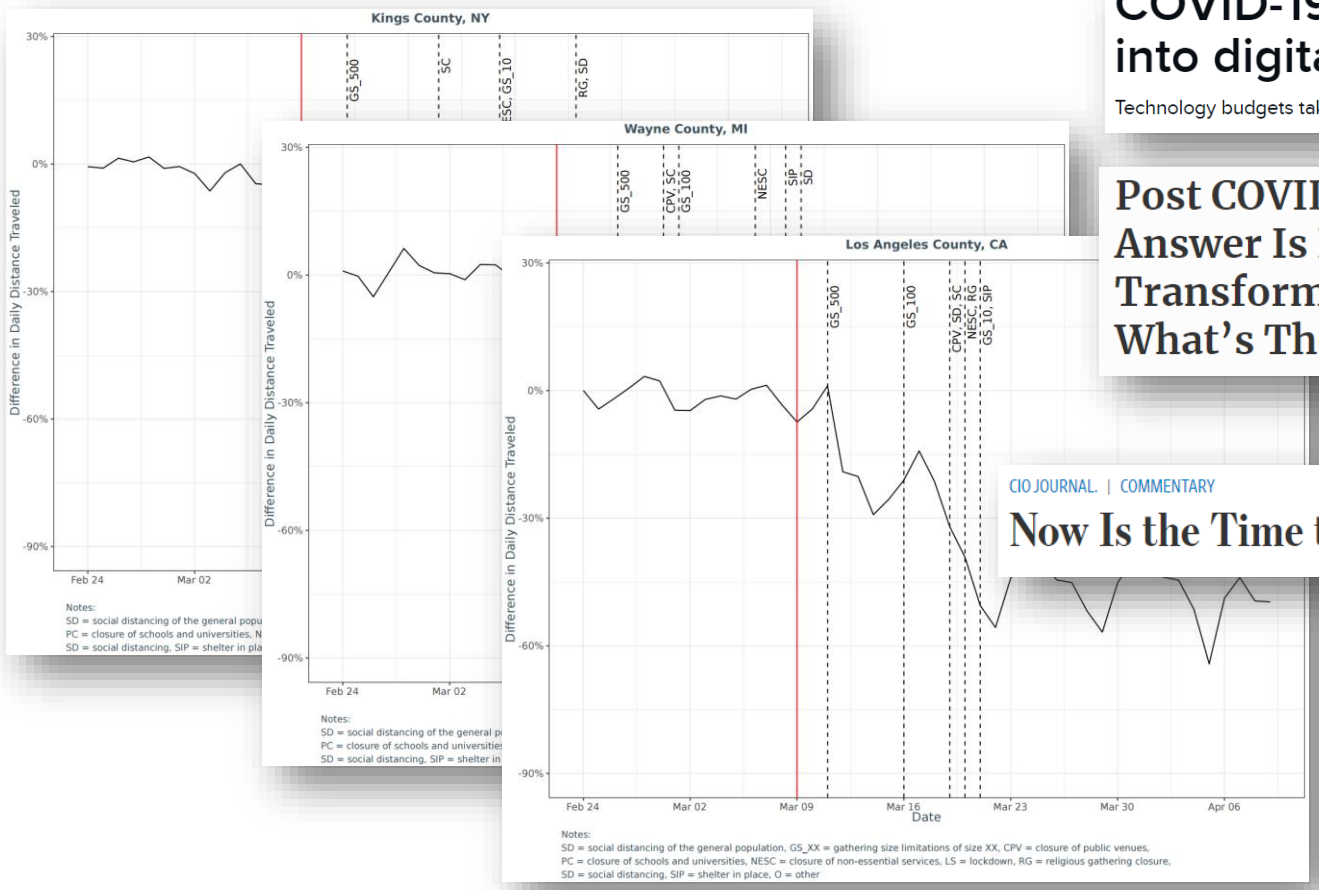
Platform Licensing

Comcast **licenses out the X1 Platform** to other cable providers; Cox launched Contour & Shaw its BlueSky TV through the X1 Platform license

Shaw ROGERS COX

Covid Acceleration

With COVID -19, digital transformation is no longer an option



COVID-19 crisis pushing organizations deeper into digital transformation

Technology budgets take hits, but tech leaders keep eye on remote work, collaborative needs.

Post COVID-19, The Answer Is Digital Transformation, Now What's The Question?

Why the Covid-19 pandemic could kick-start digital transformation at scale

CIO JOURNAL. | COMMENTARY

Now Is the Time to Evaluate Digital Transformation Skills

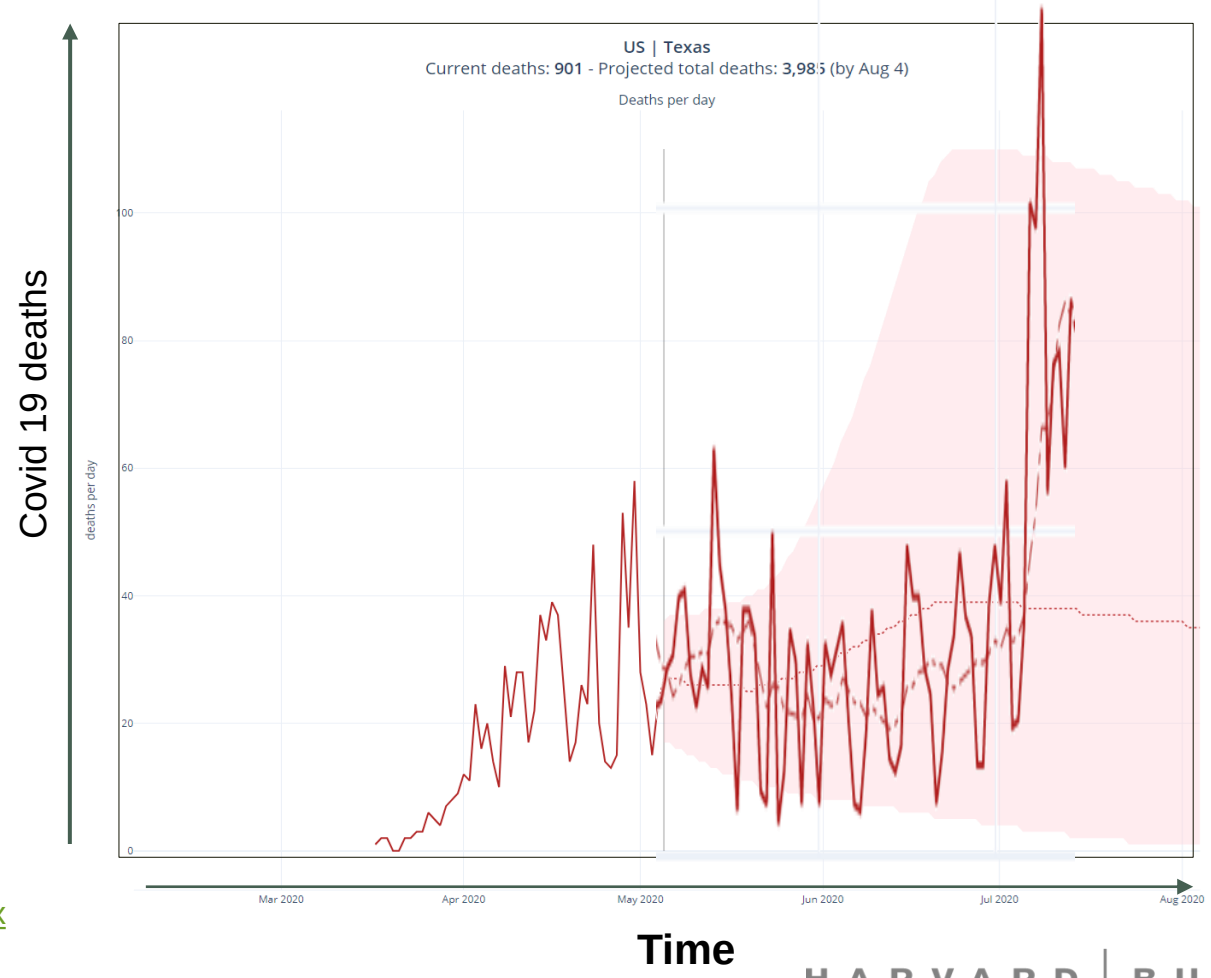
TECHNOLOGY EXECUTIVE COUNCIL

$7 trillion to be invested in making work more digital by 2023: ServiceNow CEO

PUBLISHED THU, APR 30 2020•2:13 PM EDT

https://www.keystonestrategy.com/coronavirus-covid19-intervention-dataset-model/

Beyond the mandate for virtualization and digitization, the uncertainty in both science and policy requires unprecedented agility…

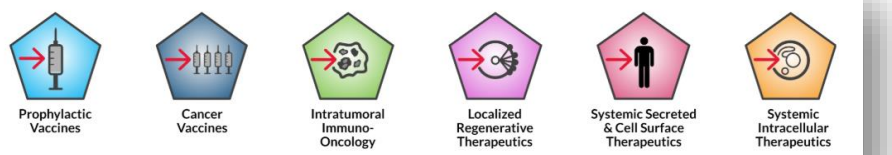


https://covid19-projections.com/us-tx

Moderna and the hunt for the COVID – 19 vaccine

The Digital Biotech Company™

Highly automated and digital enterprise focused on quality, flexibility, agility and efficiency; seamlessly integrated and orchestrated cloud-based IT systems to manage and industrialize complex planning and execution of our mRNA pipeline scale-up at every stage of development.

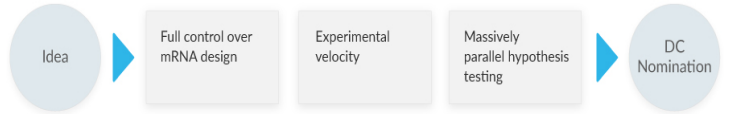


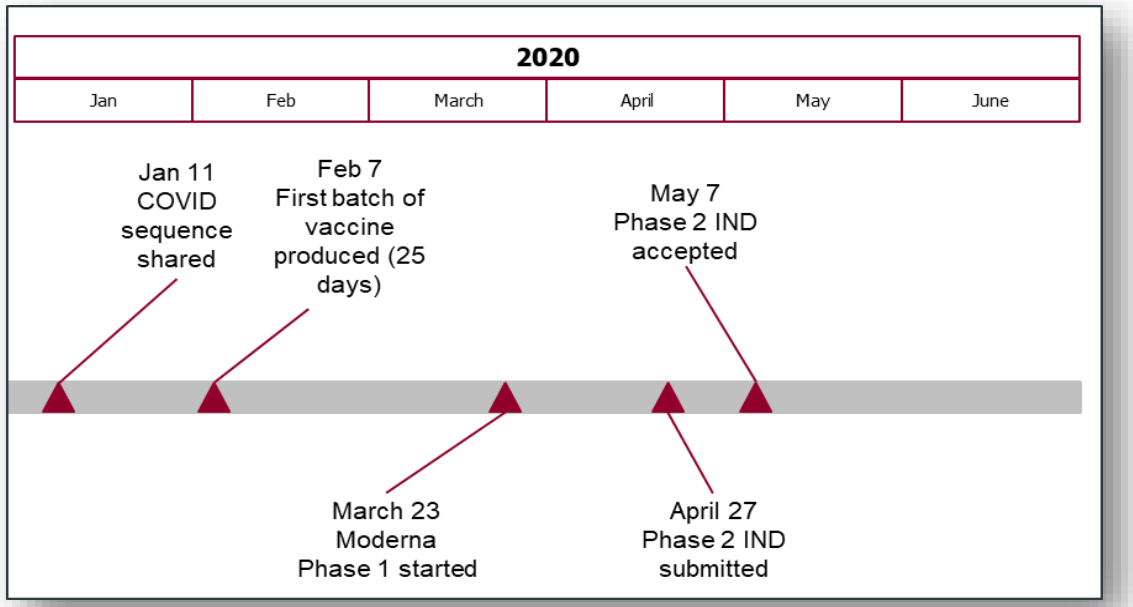
"We are a tech company that happens to do biology"

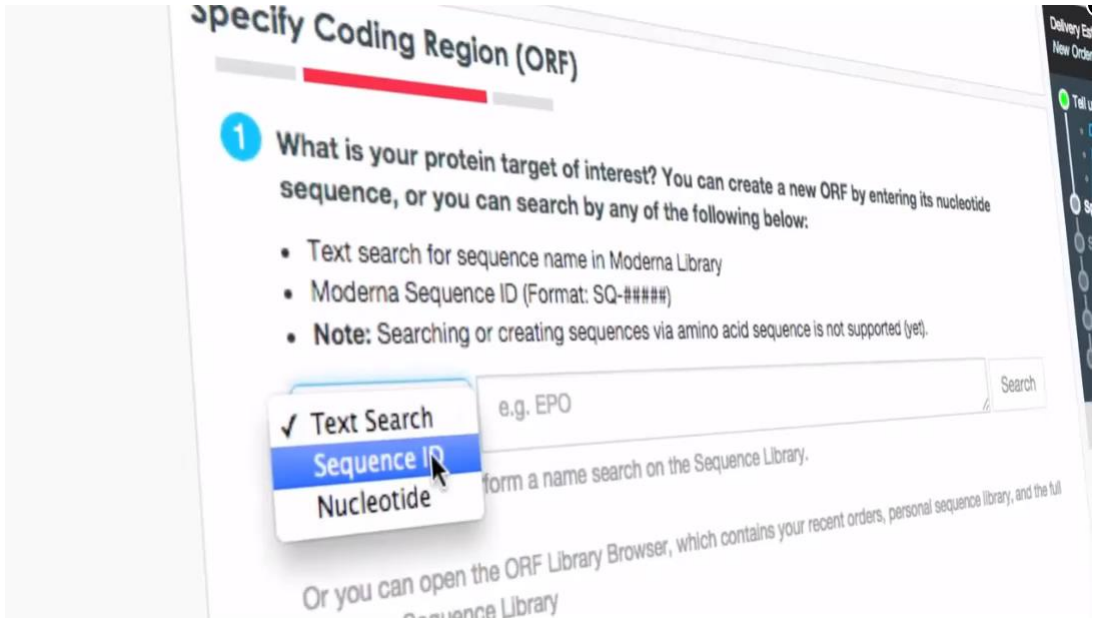
Stephane Bancel, Moderna CEO

Enabling Rapid mRNA Drug Design Research Across the Moderna Ecosystem

Our Research Engine enables us to advance new product ideas into development candidates via our drug discovery efforts, and includes infrastructure to enable rapid supply of thousands of preclinical mRNAs for research involving in vitro and in vivo experiments in order to accelerate programs from idea to development candidate designation.






Specify Coding Region (ORF)
1
What is your protein target of interest? You can create a new ORF by entering its nucleotide sequence, or you can search by any of the following below:
Text search for sequence name in Moderna Library
Moderna Sequence ID (Format: SQ-#####)
Note: Searching or creating sequences via amino acid sequence is not supported (yet).
Text Search
Sequence ID
Nucleotide
e.g. EPO
Search
form a name search on the Sequence Library.
Or you can open the ORF Library Browser, which contains your recent orders, personal sequence library, and the full

I thought I'd have to spend the next 10 years trying to validate my career by haggling at the totem poles of policy makers and insurance payors to convince them of the value in digital health and telemedicine for care delivery innovation; COVID has done this for me in only a matter of weeks.

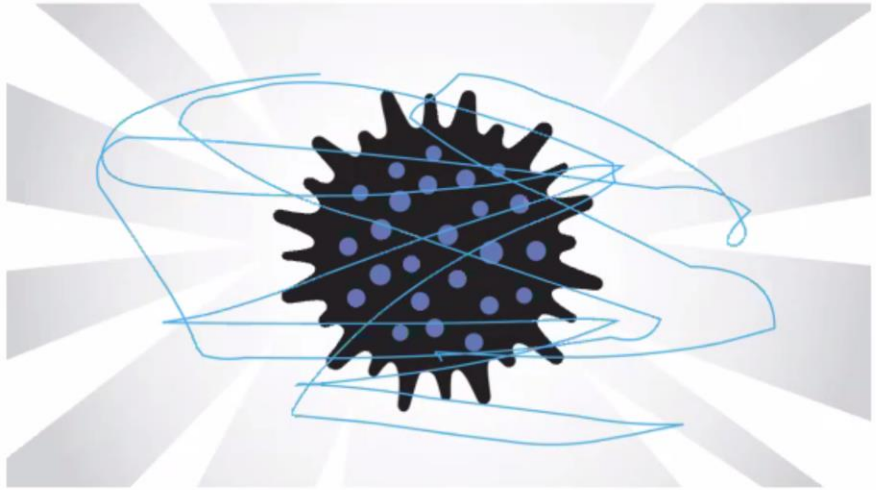
Harvard Business Review

INNOVATION

How Hospitals Are Using AI to Battle Covid-19

by Kelley A. Wittbold , Colleen Carroll , Marco Iansiti , Haipeng Mark Zhang and Adam B. Landman

April 03, 2020



- Digital health:
  - iPads for reduction in PPE run rates
  - RPM
  - Virtual Rounding
- Virtual Care
  - Epic-Integrated Zoom, Teladoc, Doxy.Me
- Artificial Intelligence
  - Apps: COVID Screener, CovidPass, PalliCovic
  - Bots: Triage, Vent Allocation, "The Dark Bot"
  - Robots: Spot (BWH/Boston Dynamics)
- Telemedicine
  - Patient-to-Provider
  - Provider-to-Provider
  - Synchronous vs. Asynchronous
  - A whole new Division within the Dept of Emergency Medicine
  - A new field of study at Harvard Medical School and nationwide

IKEA: Rebuilding the company's web presence around integrated data and AI

PRE COVID

"The Blue Boxes"

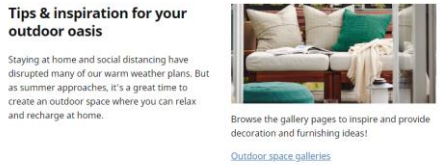
Store centered company: "for 75 years our core has been the stores"

Countries are largely autonomous

"Big silos": digital vs. retail

Product centric merchandizing teams

POST COVID


Tips & inspiration for your outdoor oasis
Staying at home and social distancing have disrupted many of our warm weather plans. But as summer approaches, it's a great time to create an outdoor space where you can relax and recharge at home.
Browse the gallery pages to inspire and provide decoration and furnishing ideas!
Outdoor space galleries

Universal web presence

"three weeks to make country websites consistent"

New AI based product recommendation algorithm deployed across all websites, mirroring what goes on in stores, but better

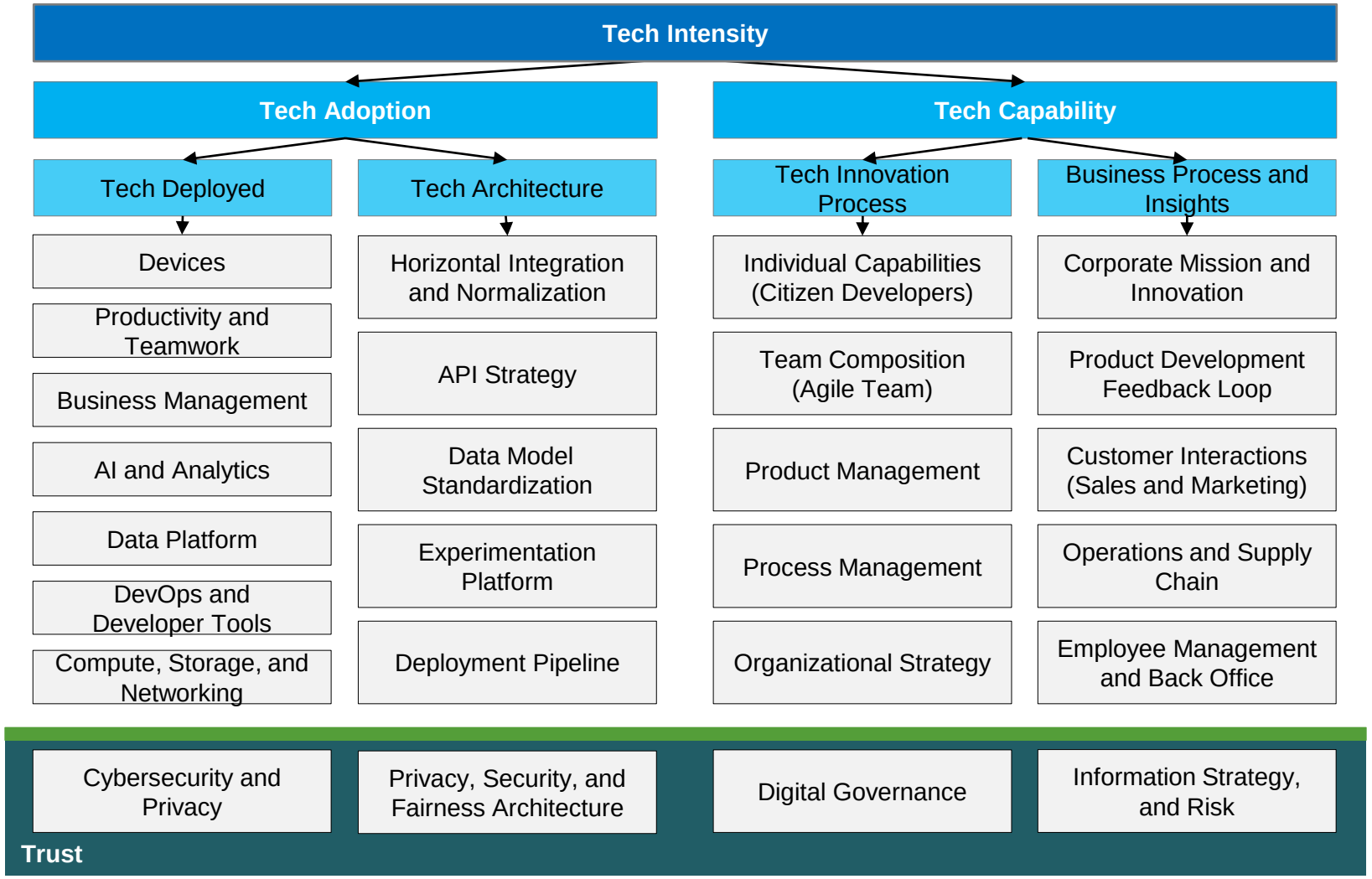
The countries allowed central algorithmic intelligence to take over, across all products and countries

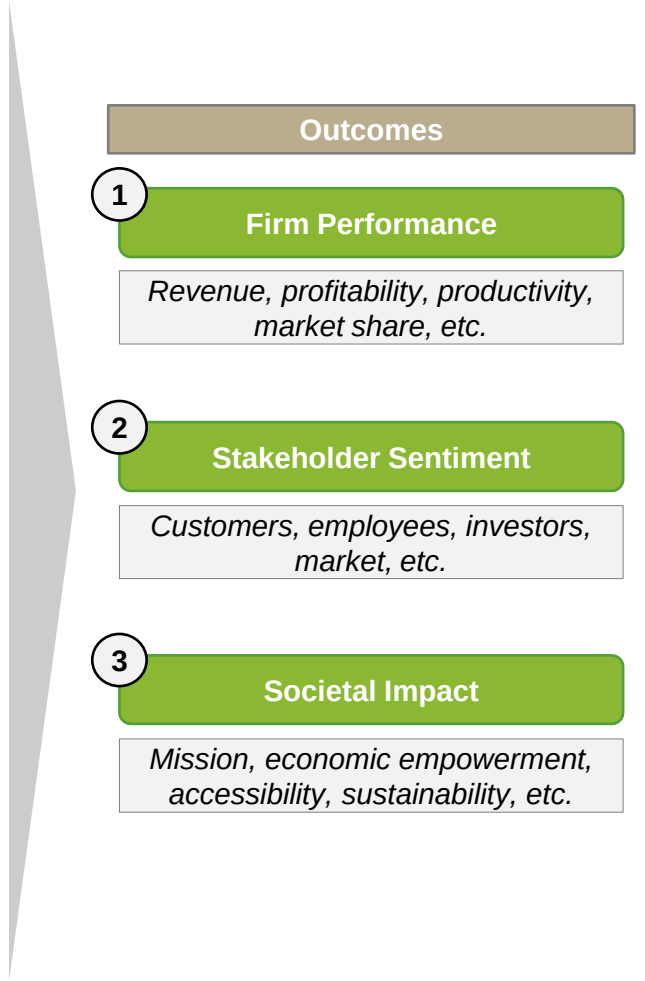
Impact: "the pie is increasing"

In some ways, we loved the crisis and what it brought. Now we need to industrialize AI across the whole company. We can leverage all kinds of new opportunities to drive the IKEA ecosystem into the home, drive costs down and enable the workforce to do fundamentally new things
- Barbara Martin Coppola, CDO IKEA

Assessing Transformation

Using an AI scorecard framework, we can benchmark firms in terms of their stage of analytics, AI, and digital transformation





Source: Keystone research and analysis, Spring 2020

Ramped up research program across the economy

Sector	Example Companies *(Selection criteria: Public, $1B+, US-based)*
Healthcare	AMGEN, HCA Healthcare, MERCK, Baxter, DaVita, Biogen, Medtronic, Pfizer, Dentsply Sirona, Johnson & Johnson, VERTEX, tenet HEALTH, GILEAD, CardinalHealth, Lilly, REGENERON, BD, Cerner
Retail	Lbrands, Kroger, BED BATH & BEYOND, NORDSTROM, Walgreens, TIFFANY & CO., tapestry, RALPH LAUREN, GAP, Walmart, ESTĒE LAUDER, LOWE'S, CVS Health, TAILORED BRAND, KOHL'S, chico's
Manufacturing	JABIL, Kraft Heinz, Kimberly-Clark, Raytheon, GE, GENERAL DYNAMICS, NIKE, P&G, NORTHROP GRUMMAN, TENNECO, AVERY DENNISON, L3HARRIS, Johnson Controls, DANAHER, Kellogg's, xerox, CORNING, BOEING, StanleyBlack&Decker, EATON, Honeywell, CATERPILLAR, Coca-Cola, Western Digital, LOCKHEED MARTIN
Financial Services	AIG, TRAVELERS, AMERICAN EXPRESS, MetLife, BNY MELLON, MARKEL, Eaton Vance, Capital One, CHUBB, CENTENE Corporation, citi, THE HARTFORD, JPMorganChase, BANK OF AMERICA, mastercard, Prudential, WELLS FARGO, ASSURANT, Goldman Sachs, Morgan Stanley, MoneyGram, UNITEDHEALTH GROUP, charles SCHWAB, Lincoln Financial Group, FIFTH THIRD BANK

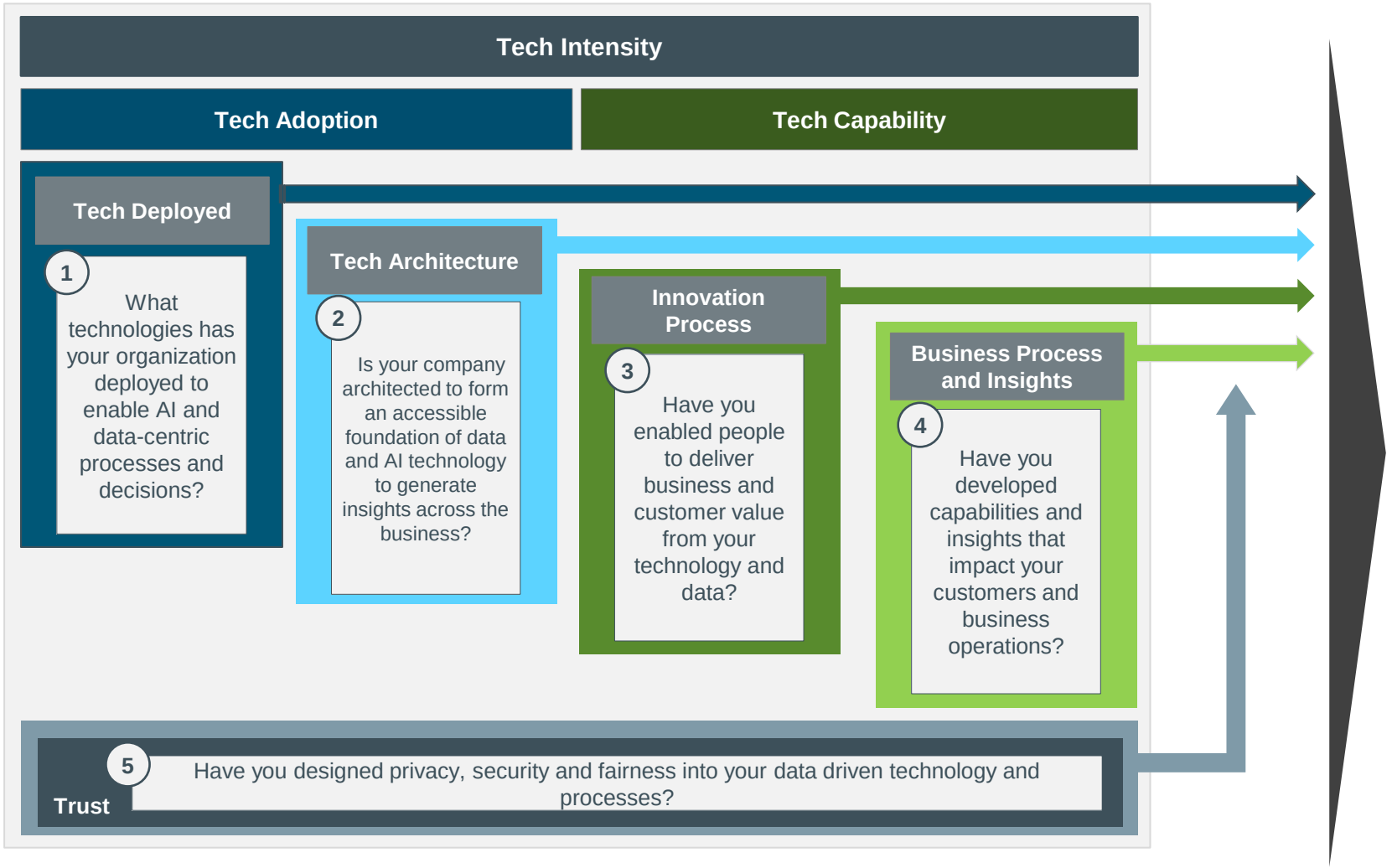
Collaboration with Keystone Strategy LLC and Microsoft Corporation

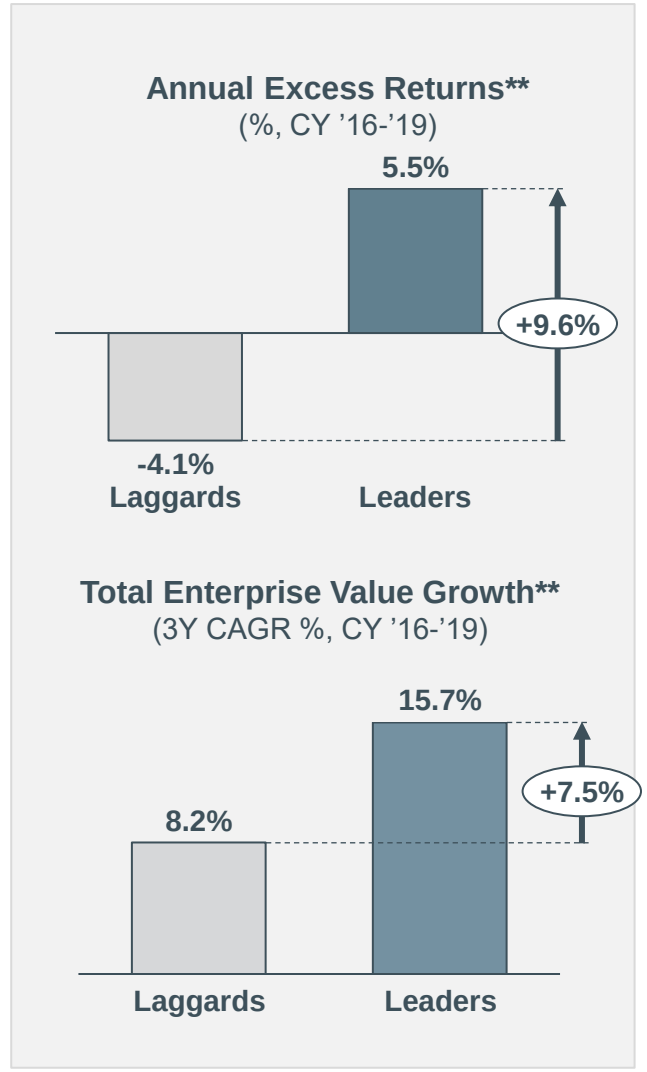
Digital Natives and gathered initial Tech Intensity data points through “high maturity” pilot interviews

#	“Digital Native” Companies	Roles
15 Interviews Completed	*“Born in the cloud”, modern “tech” companies, AI-first “startups”*	• Engineering Director, Knowledge / AI Platform • VP, Product • Head of Intelligent Automation • Chief Data Scientist • Lead Architect • VP, Data Science Engineering • Research Scientist • Principal, Data and Analytics • Associate Professor of Information Systems & Data Science Lead • Senior Data Engineer • Senior Product Manager, Machine Learning Platform

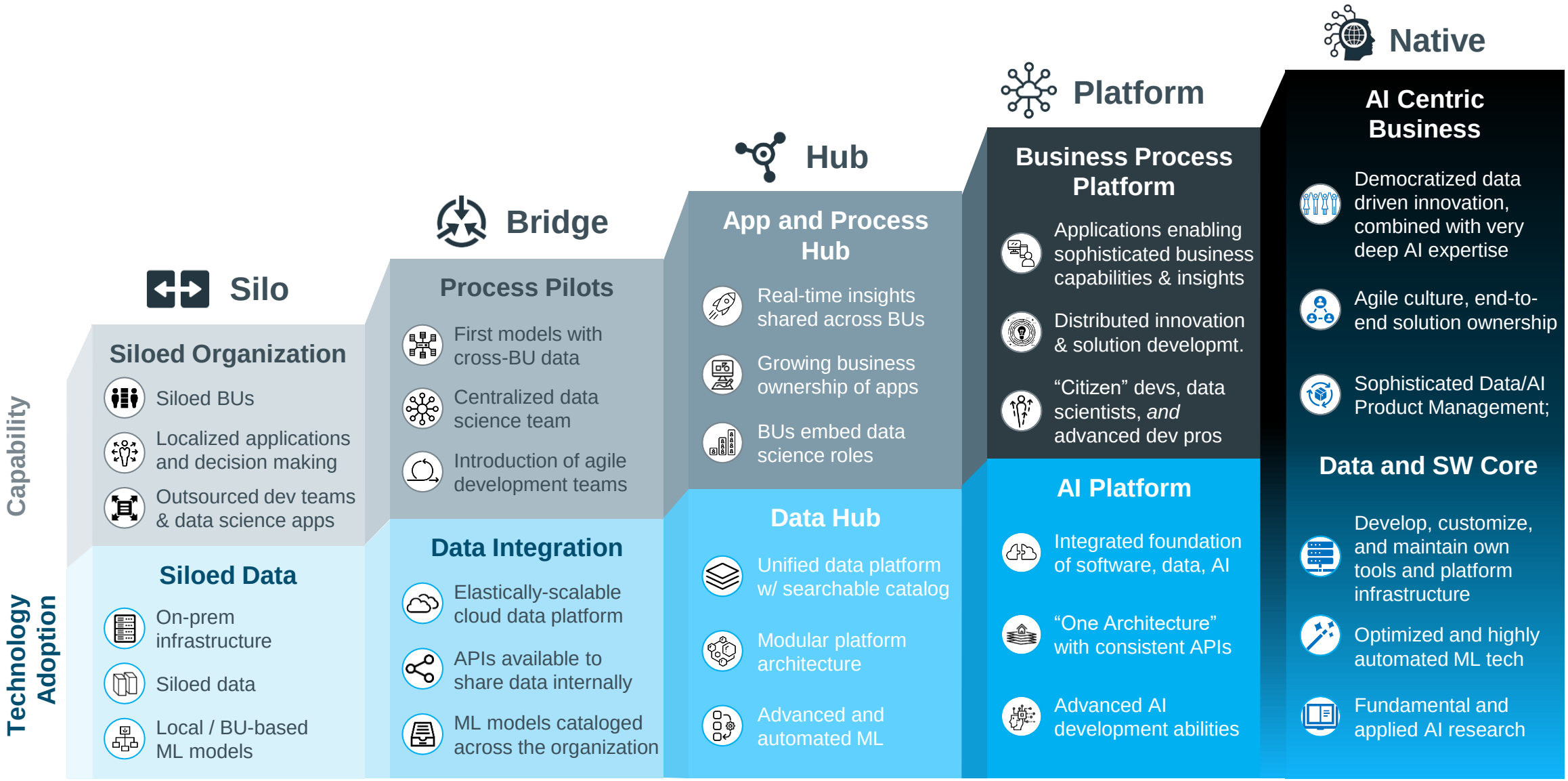
amazon · NETFLIX · Spotify · Google · Uber · STITCH FIX · FACEBOOK · Square · VIA · twitter · CONVOY · salesforce · tamr · Apex.AI

Our research shows a strong relationship between data centricity and AI deployment capabilities and enterprise performance


Tech Intensity
Tech Adoption
Tech Capability
Tech Deployed
1
What technologies has your organization deployed to enable AI and data-centric processes and decisions?
Tech Architecture
2
Is your company architected to form an accessible foundation of data and AI technology to generate insights across the business?
Innovation Process
3
Have you enabled people to deliver business and customer value from your technology and data?
Business Process and Insights
4
Have you developed capabilities and insights that impact your customers and business operations?
5
Trust
Have you designed privacy, security and fairness into your data driven technology and processes?



Source: Keystone Strategy LLC


Capability
Technology Adoption
Silo
Siloed Organization
Siloed BUs
Localized applications and decision making
Outsourced dev teams & data science apps
Siloed Data
On-prem infrastructure
Siloed data
Local / BU-based ML models
Bridge
Process Pilots
First models with cross-BU data
Centralized data science team
Introduction of agile development teams
Data Integration
Elastically-scalable cloud data platform
APIs available to share data internally
ML models cataloged across the organization
Hub
App and Process Hub
Real-time insights shared across BUs
Growing business ownership of apps
BUs embed data science roles
Data Hub
Unified data platform w/ searchable catalog
Modular platform architecture
Advanced and automated ML
Platform
Business Process Platform
Applications enabling sophisticated business capabilities & insights
Distributed innovation & solution developmt.
"Citizen" devs, data scientists, and advanced dev pros
AI Platform
Integrated foundation of software, data, AI
"One Architecture" with consistent APIs
Advanced AI development abilities
Native
AI Centric Business
Democratized data driven innovation, combined with very deep AI expertise
Agile culture, end-to-end solution ownership
Sophisticated Data/AI Product Management;
Data and SW Core
Develop, customize, and maintain own tools and platform infrastructure
Optimized and highly automated ML tech
Fundamental and applied AI research

The best firms: Architecture

A modern data and organizational architecture enables cross-functional collaboration to provide maximum value for business needs

Consistent and reliable data

Modern IT architecture creates a standardized “single source of truth” for data across the organization

Universal data accessibility

Modular design of infrastructure and applications allows for easy interaction with most relevant data across teams and externally

Easy navigation of data

Data set designs are driven by business needs and user-friendly to enable self-service access

Robust cataloging and documentation

Centralized management of data and ML model catalogs enable ease of integration and improvement over time

Common access to AI models maximizing sharing and re-use

Easy access to latest models and a robust experimentation platform maximize sharing and learning across the organization

Privacy, security, and fairness architecture

Management of data and models automatically incorporates compliance with regulations and security guidelines

The best firms: Innovation Process

Individuals, teams, and the organization as a whole engage in a streamlined, strategic approach to AI/ML adoption, deployment, and governance

Individual empowerment for innovation

Business and IT users are well-equipped with the tools, training, and systems to leverage tech and make data-driven decisions

Organizational infrastructure for AI adoption

An established organizational infrastructure for product management and processes allows users to optimize technology for business needs

Widespread agile processes

Cross-disciplinary agile teams independently create solutions through best practice product management principles and rapid iteration

Codified best practices for AI-first operating model

A CoE and cross-disciplinary steering committees establish best practices around the adoption, deployment, and governance of AI/ML

Tight integration between IT and business capabilities

The close coupling of IT capabilities and business needs enables a more customer-centric approach to solutions

Established digital governance

Standard procedures around security, ethics, and compliance are well-understood and enforced through management structures

The best firms: Technology

Organizations are able to leverage best-in-class AI/ML tools to make strategic data driven decisions and adopt an "AI-First" approach

Modern technology enabling real-time analyses

A flexible and scalable data infrastructure enables real-time use cases and the ability to rapidly perform data-intensive analyses

Accessible in-house AI and data models

AI and Data technologies developed in-house are made available for end users without complex deployment processes

Advanced AI/ML analytics

The organization uses advanced AI/ML to generate insights and predictions that supplement and expand human analysis

Broad deployment of AI/ML technology

AI/ML and advanced analytics are broadly implemented in both customer-facing applications and across a variety of internal functions

Advanced data and AI tools

Advanced tools across the firm allow both IT and business users to access and analyze data in new and complex ways

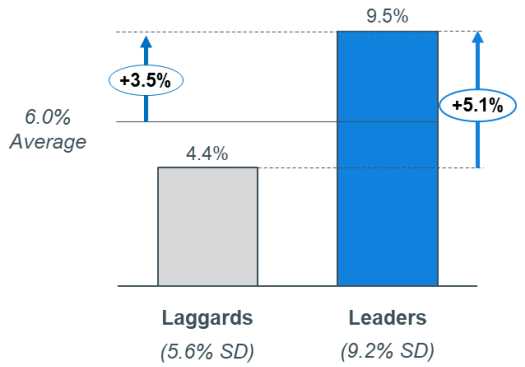
Information security and risk technology

Data security tools and technologies enable evaluation of business and IT risk factors and support data privacy and protection

Operating Model Architecture and AI Technology enable growth

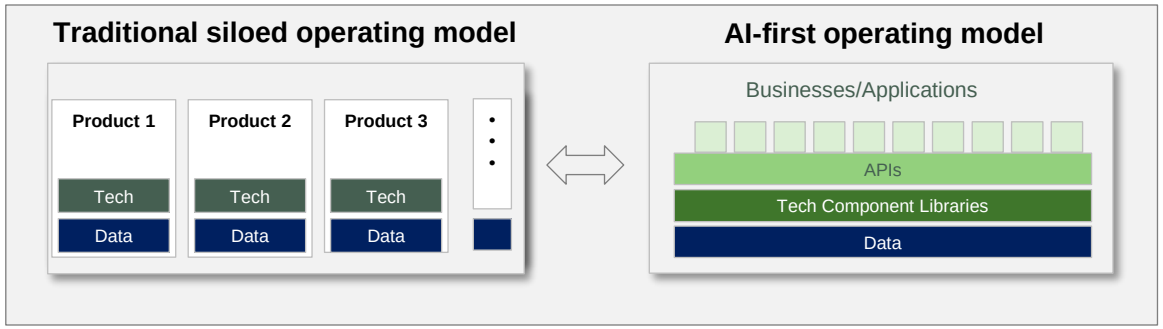
*Revenue Growth: 3-Year CAGR (%) ***

*(Laggard vs. Leader Quartiles based on **AI Technology Deployed x Architecture** Score)*



The technology deployed index represents the degree of sophistication in data sciences and AI oriented technologies

The technology architecture index represents the way in which technology is organized and integrated

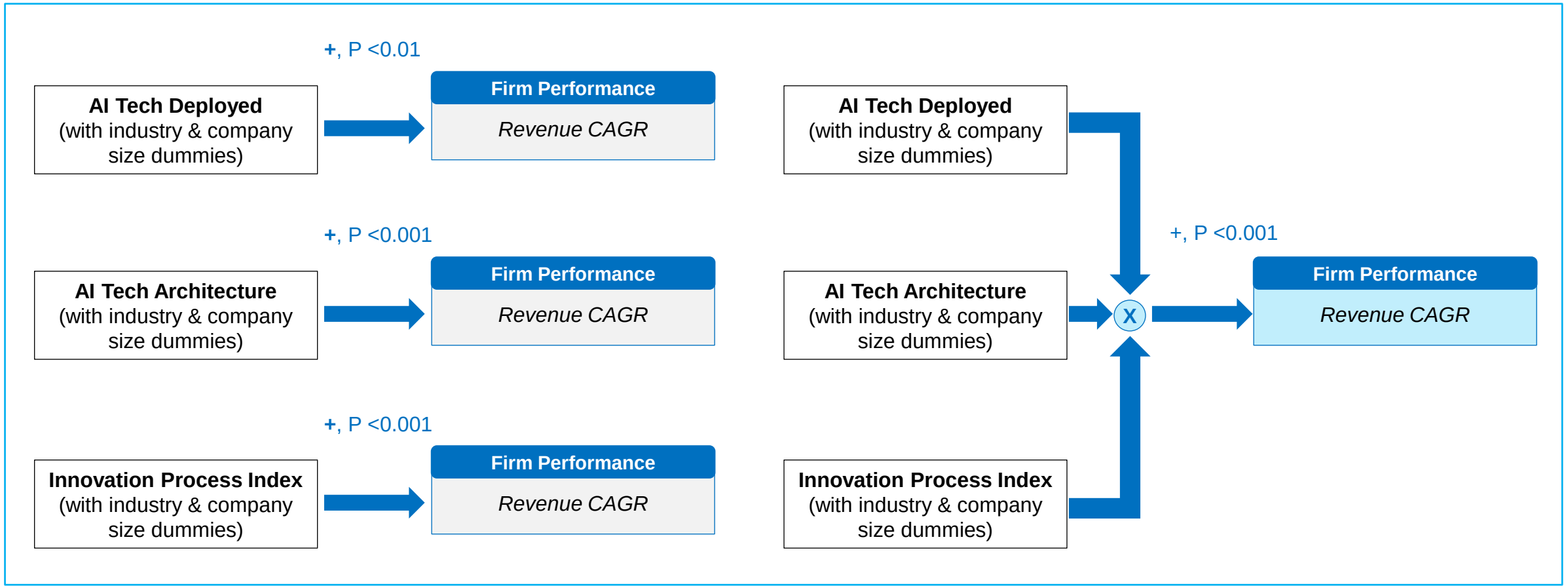


The relationship between Revenue Growth and AI Tech Deployed * Architecture is significant, with P<0.001

Independent Variables:	*Effect on:* **Revenue Growth (3Y CAGR)**
Industry (controls):	
Pharma, Biotech, Med Device	0.25
Healthcare Services	0.21
Financial Services	0.25
Retail	0.22
Aerospace and Defense	0.30
Large Machinery and Equipment	0.29
Diversified Parts & Electrical Equipment	0.23
Consumer Goods	0.21
Manufacturing Conglomerates	0.21
Technology Hardware	0.20
Company Size (control):	
Revenue (log)	-0.022
Tech Deployed x Architecture	**0.00021*****
*****P=0.00040**	
Observations	118
R-squared	0.273

Source: Keystone research and analysis, May 2020

Summarizing our results, Technology Deployed, Architecture, and Innovation Process Indices correlate with revenue growth, both individually and when combined


+, P <0.01
AI Tech Deployed (with industry & company size dummies)
Firm Performance
Revenue CAGR
+, P <0.001
AI Tech Architecture (with industry & company size dummies)
Firm Performance
Revenue CAGR
+, P <0.001
Innovation Process Index (with industry & company size dummies)
Firm Performance
Revenue CAGR
AI Tech Deployed (with industry & company size dummies)
AI Tech Architecture (with industry & company size dummies)
Innovation Process Index (with industry & company size dummies)
X
+, P <0.001
Firm Performance
Revenue CAGR

Source: Keystone research and analysis, Summer 2020 (N=118 final dataset)

In summary

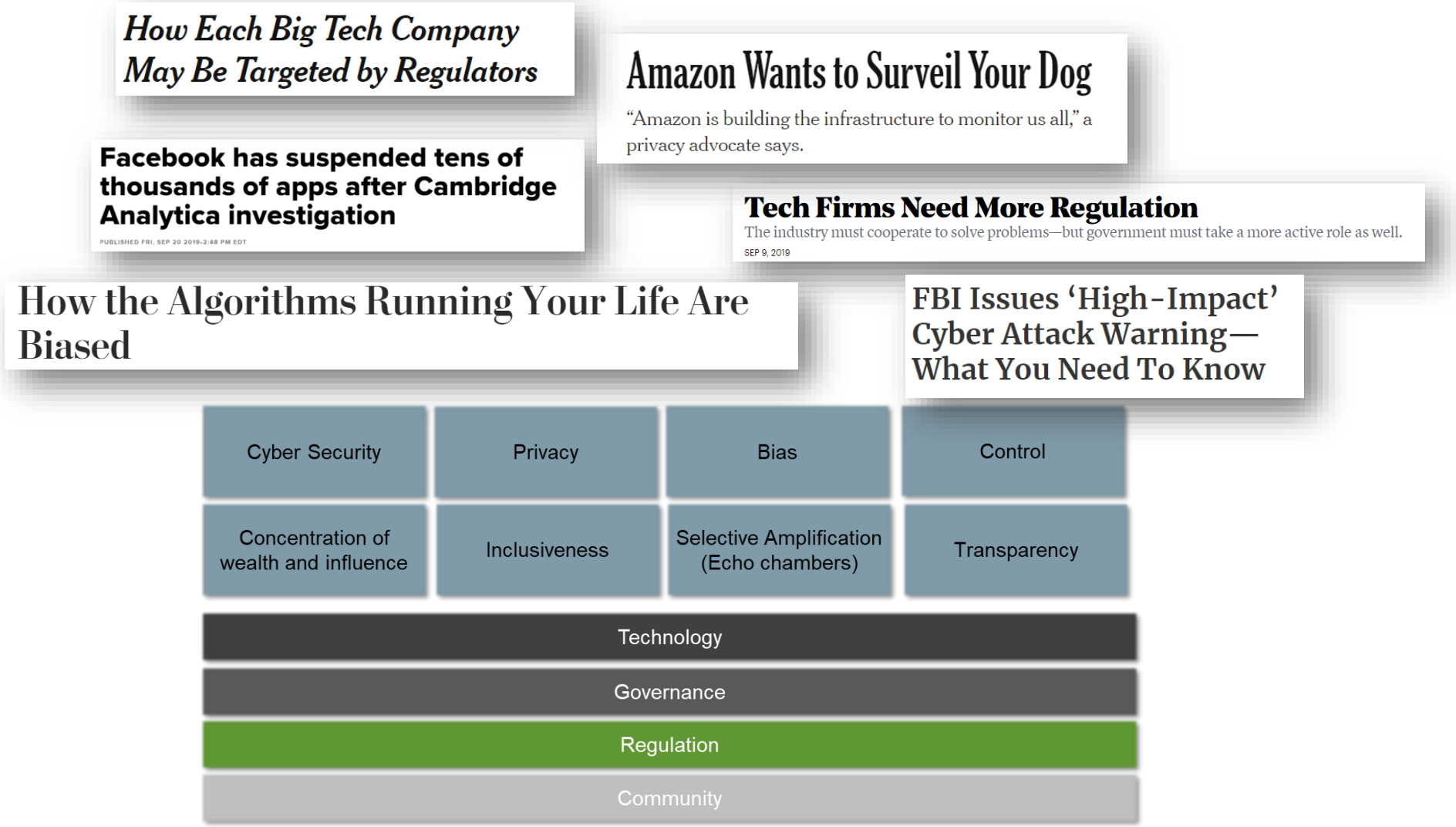
Opportunities

AI and digitization can improve a virtually infinite variety of compelling use cases, cutting across every segment of our economy

By moving human labor and management off the critical path, AI can transform the enterprise

Responsibilities

The new ethics of digital scale, scope, and learning


How Each Big Tech Company May Be Targeted by Regulators
Amazon Wants to Surveil Your Dog
"Amazon is building the infrastructure to monitor us all," a privacy advocate says.
Facebook has suspended tens of thousands of apps after Cambridge Analytica investigation
PUBLISHED FRI, SEP 20 2019•2:48 PM EDT
Tech Firms Need More Regulation
The industry must cooperate to solve problems—but government must take a more active role as well.
SEP 9, 2019
How the Algorithms Running Your Life Are Biased
FBI Issues 'High-Impact' Cyber Attack Warning—What You Need To Know
Cyber Security
Privacy
Bias
Control
Concentration of wealth and influence
Inclusiveness
Selective Amplification (Echo chambers)
Transparency
Technology
Governance
Regulation
Community

A Call to Action

Understand and actively anticipate the transformation of our economic and social environment

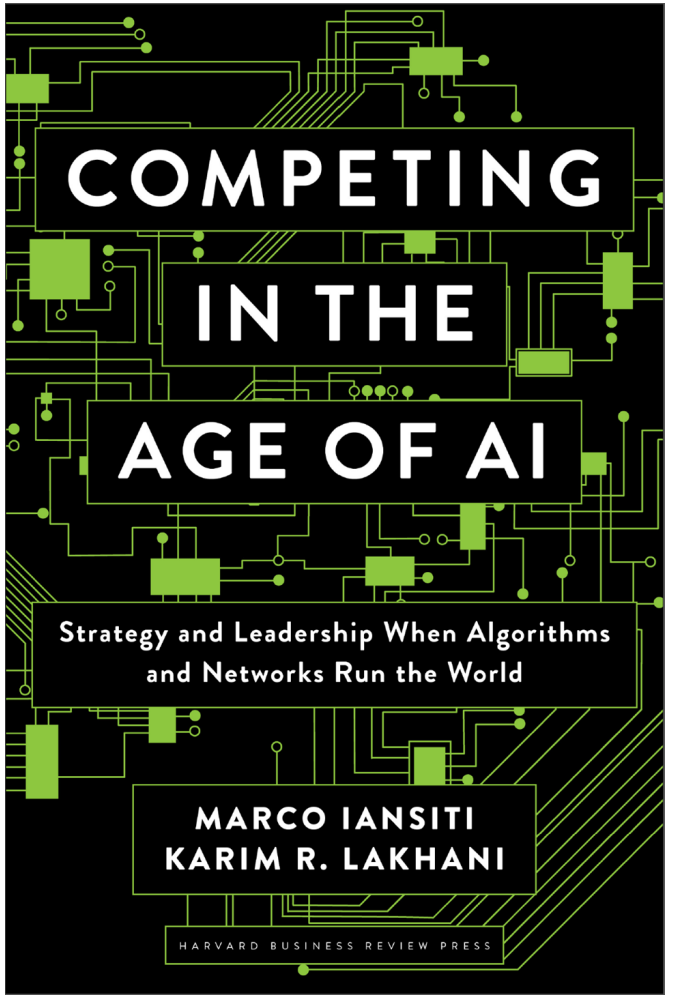
Drive business and operating model transformation consistently and provide clarity from the the top down

Invest heavily not only in technology, but also in innovation process and technology and organizational architecture

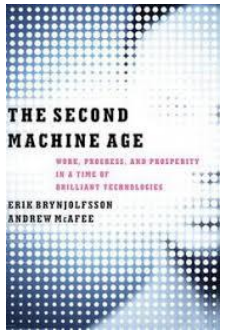
Use pilots as opportunities to build internal capabilities and with a process and plan to implement and scale

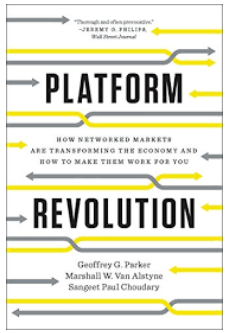
Build inclusion, privacy, transparency and security from the ground up

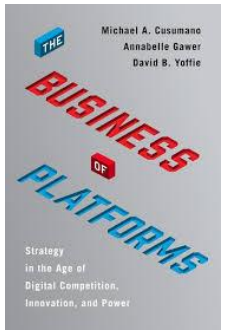
Help the increasing part of the population in greater need

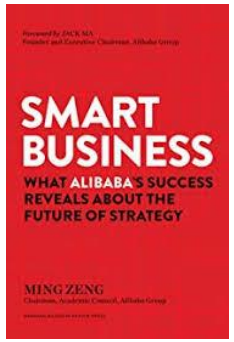


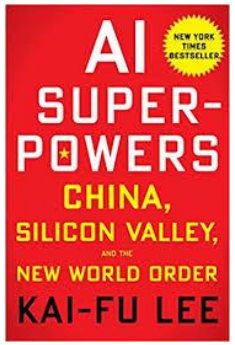
List of further readings

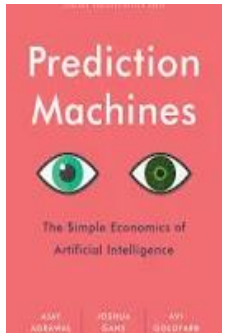


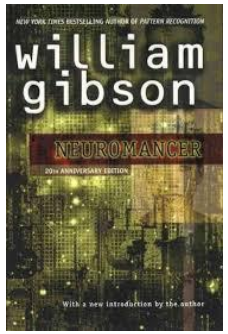


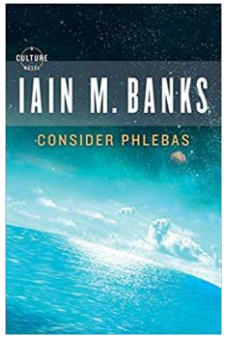

Michael A. Cusumano
Annabelle Gawer
David B. Yoffie
THE BUSINESS OF PLATFORMS
Strategy in the Age of Digital Competition, Innovation, and Power

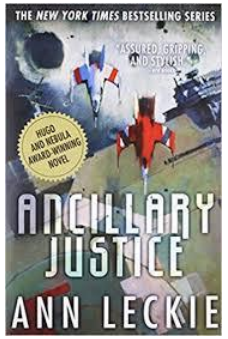




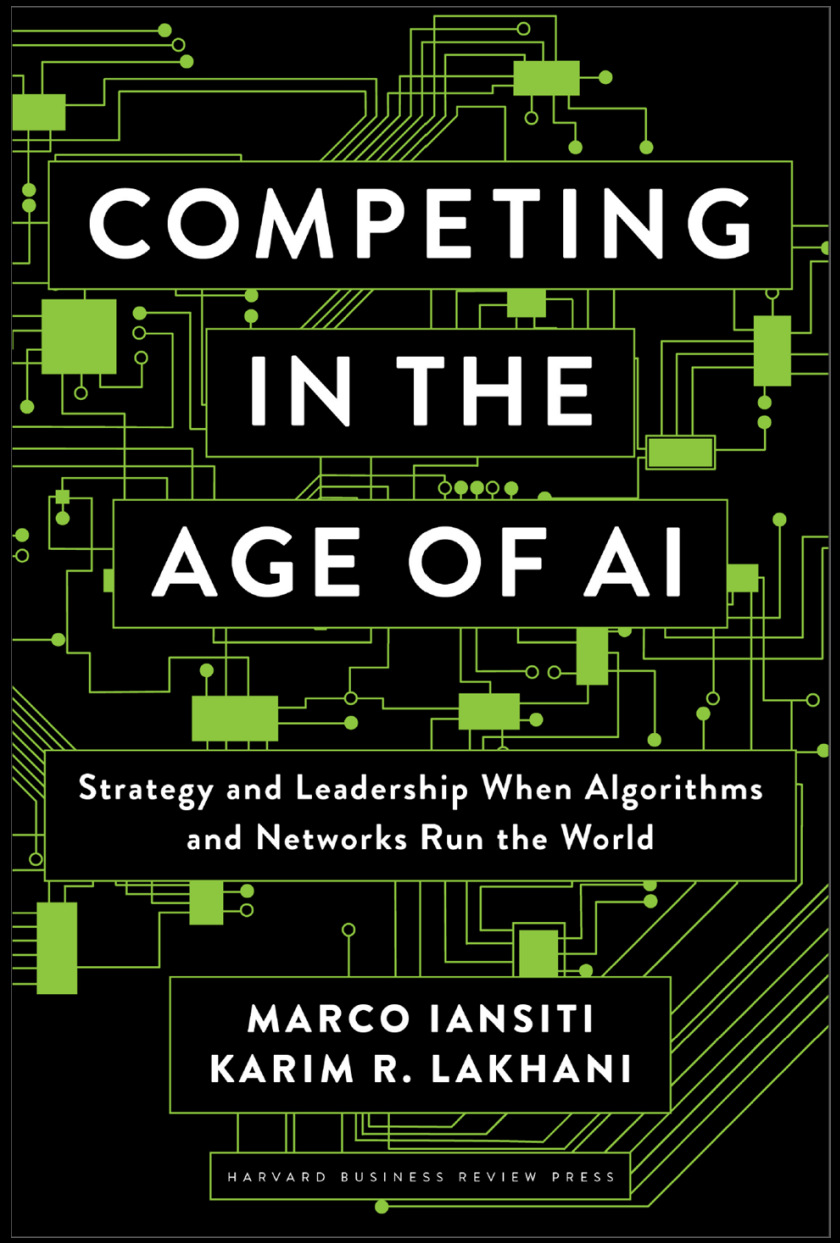








Fiction


COMPETING
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Strategy and Leadership When Algorithms and Networks Run the World
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